



# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

## **THESIS**

**PREDICTORS OF RETENTION IN A HOMELESS  
VETERAN INTERVENTION PROGRAM**

by

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December 2012

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**PREDICTORS OF RETENTION IN A HOMELESS VETERAN  
INTERVENTION PROGRAM**

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## **ABSTRACT**

This study assessed the value of a specific set of client variables in predicting treatment phase retention and overall program completion of an intervention treatment program for homeless veterans. Treatment programs can improve the lives of homeless individuals, but many participants leave prematurely. Certain characteristics, which are evident upon admission, may help to identify those veterans at greater risk of early discharge and program failure. Spanning three years (2009–2011), the records of 680 unique clients from a homeless veterans program were reviewed. Logistic regression models yielded significant association between treatment completion, graduation, and certain observable client characteristics. Ultimately, information regarding a client's mental health, chronic health, and the client's immediate prior residence before admission to the Veteran Rehabilitation Center program proved to be significant independent predictors of premature discharge from treatment. From the significant covariates for the treatment model, a simple, scoring-scheme heuristic was developed to enable treatment providers to expeditiously and accurately assess relative risk of premature discharge among a cohort of veteran clients. Using demographic information from three simple questions, the scoring scheme has a 98.3% correlation to the theoretical probability of failure from treatment and gives providers a simple and accurate way to identify those at greater risk of early exit. These results can inform targeted intervention strategies to maximize program effectiveness and efficiency. They provide a decision support tool to help high-risk veterans remain engaged in treatment, attain treatment goals, graduate, and fully prepare them to reintegrate into a sober, self-sustaining lifestyle.

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

AA	Alcoholics Anonymous
ABC	American Broadcasting Company
AHAR(s)	Annual Homeless Assessment Report(s)
AVF	All-Volunteer Force
CoC	Continuum of Care
CSTAR	Client Service Tracking and Reporting
CWT	Compensated Work Therapy
DCHV	Domiciliary Care for Homeless Veterans
DOL	U. S. Department of Labor
EUL	Enhanced-Use Lease
FR	Federal Register
GED/HS	General Educational Development /High School
GPD	Grant and Per Diem
HCHV	Health Care for Homeless Veterans
HEARTH	Homeless Emergency Assistance and Rapid Transition to Housing
HHS	Health and Human Services
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HMIS	Homeless Management Information System
HOPWA	Housing Opportunities for Persons with AIDS
HPRP	Homelessness Prevention and Rapid Re-Housing Program
HUD	U.S. Department of Housing and Urban Development
HUD-VA	Housing and Urban Development-Veterans Affairs
HUD-VASH	Housing and Urban Development-Veterans Affairs Supportive Housing
HVOC	Homeless Veterans Outreach Coordinator
HVRP	Homeless Veterans Reintegration Program
NA	Narcotics Anonymous
NCHV	National Coalition for Homeless Veterans
OMB	Office of Management and Budget

P.L.	Public Law
PHA	Public Housing Authority
PTSD	Post-Traumatic Stress Disorder
SAS	Statistical Analysis System
S.M.A.R.T.	Service Member Attrition Risk Tool
SRO	Single Room Occupancy Dwellings
SSVF	Supportive Services for Veterans Families
TAP	Transition Assistance Program
TBI	Traumatic Brain Injury
VA	U. S. Department of Veterans Affairs
VASH	Veterans Affairs Supportive Housing
VBA	Veterans Benefits Administration
VETS	Veterans Employment and Training Service
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network
VRC	Veterans Rehabilitation Center
VVSD	Veterans Village of San Diego
WAVE	Wellness and Vocational Enrichment



## **EXECUTIVE SUMMARY**

Veteran homelessness is a problem in the United States. Almost 145,000 veterans experienced homelessness in 2010. Substance abuse and substance abuse treatment are major factors when discussing veteran homelessness. Homeless veterans have much higher rates of substance abuse than non-veteran homeless persons. Because substance abuse treatment for both drugs and alcohol has been proven to work, one of the most common predictors of positive outcomes for substance abuse treatment is the ability to retain clients (homeless or not) in treatment. Although a significant amount of research has been conducted to identify the predictors of retention among non-homeless and nonveteran persons with substance use disorders, little is known about the predictors of retention among homeless veterans who have those same disorders.

Treatment programs can improve the lives of homeless individuals, but many participants leave prematurely. Certain characteristics, which are evident upon admission, may help to identify those veterans at greatest risk of early discharge and program failure. This study assessed the value of a specific set of client variables in predicting treatment phase retention and overall program completion of an intervention treatment program for homeless veterans. Spanning three years (2009–2011), the records of 680 unique clients from a homeless veterans program were reviewed. Logistic regression models yielded significant association between treatment completion, graduation, and certain observable client characteristics.

The goal of this study was to determine if a collection of pretreatment variables were associated retention and program completion among a cohort of male and female homeless veterans with substance use disorders who were seeking treatment in a comprehensive intervention program called the Veterans Rehabilitation Center (VRC) at the Veterans Village of San Diego (VVSD). Logistic regression analysis was used to generate two predictive models of retention; one for treatment completion and another for program completion.

The models were fit to data on 680 military veterans discharged from the VVSD VRC program between 2009 and 2011. Results indicated that self-reported information

regarding a client's mental health status, chronic health status, and immediate residence prior to admission into the VRC were statistically associated with outcomes in treatment retention and program success in the VRC. From the significant covariates for the treatment model, a simple, scoring-scheme heuristic was developed to enable treatment providers to assess relative risk of premature discharge among a cohort of veteran clients. Using demographic information from three simple questions, the scoring scheme has a 98.3% correlation to the theoretical probability of failure from treatment and gives providers a simple way to identify those at greater risk of early exit.

These results may be informative for identifying veterans who have the highest risk of premature discharge and will help identify methodologies for improving the efficiency and effectiveness of the VRC program, and provide insight for improving similar treatment programs with larger client populations. The results can inform targeted intervention strategies to maximize program effectiveness and efficiency, and provide a decision support tool to help high-risk veterans remain engaged in treatment, attain treatment goals, graduate, and fully prepare them to reintegrate into a sober, self-sustaining lifestyle.

## **ACKNOWLEDGMENTS**

This thesis work is dedicated to my father, Vincent Pierre Coté. As your son, I hope I have made you proud.

In addition, this thesis work is dedicated to all military personnel, both veterans and active duty, who battle the problems of substance abuse, mental illness, physical disability, social isolation, and homelessness as a result of war and military deployment. This nation is truly grateful for your service and I hope this body of work can be a small contribution to improving your condition.

I would like to thank my advisor, Dr. Ron Fricker. You have been a tremendous advisor, and an exceptional mentor throughout my time at the Naval Postgraduate School. Thank you for giving me vision in my blind spots. I am grateful that you agreed to be my advisor when I first approached you with the concept of this project so many years ago.

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## **I. INTRODUCTION**

The willingness with which our young people are likely to serve...shall be directly proportional to how they perceive the Veterans of earlier wars were treated and appreciated by their nation.

–George Washington

With malice toward none, with charity for all, with firmness in the right as God gives us to see the right, let us strive on to finish the work we are in, to bind up the nation's wounds, to care for him who shall have borne the battle and for his widow and his orphan.

–Abraham Lincoln  
Second Inaugural Address, March 4, 1865

We are forever in debt to a generation whose sacrifice has made this country safer and more respected. We will never forget you . . . . When you take off the uniform, we will serve you as well as you've served us because no one who fights for this country should have to fight for a job, or a roof over their head, or the care that they need when they come home.

–President Barack Obama  
Democratic National Convention  
Acceptance Speech, September 6, 2012

### **A. PURPOSE**

This thesis assesses the value of a specific set of client variables in predicting treatment retention and completion of a rehabilitation program for homeless veterans at Veterans Village of San Diego (VVSD). Based on treatment program data for clients who discharged from the VVSD Veterans Rehabilitation Center (VRC) program between 2009 and 2011, a decision support tool is developed to help case managers identify high-risk clients and help these veterans remain engaged in treatment, attain treatment goals, graduate, and fully prepare them to reintegrate into a sober, self-sustaining lifestyle. Via the decision support tool, a risk metric can be computed for each veteran checking into the VRC program, and VVSD leadership can thereby increase program effectiveness and efficiency by optimizing resource allocation, customizing client treatment plans, and making targeted interventions for clients who have the greatest risk of attrition. In short,

the work of this thesis provides a new mechanism to homeless veteran treatment programs to help them reduce the number of treatment episodes for veterans.

Retention in treatment is a critical determinant of the success of the VRC and other programs like it (Justus, Burling, & Weingardt, 2006). Understanding factors related to client retention is even more important since the literature has found a strong correlation between retention and positive, long-term outcomes (Orwin, Garrison-Mogren, Jacobs, & Sonnefeld, 1999). Some studies have found that the duration of treatment is a more important predictor than the actual treatment itself (Moos & Moos, 2003). Retention can become even more important for veterans who suffer from repeated episodes of homelessness which can increase their exposure diseases like hepatitis and Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) (Zerger, 2002).

## **B. PROBLEM**

Military veterans constitute a significant proportion of the adult homeless population (Burt & Cohen, 1989; Dougherty, 2006). According to the U.S. Housing and Urban Development (HUD) Supplemental Report to the 2010 Annual Homeless Assessment Report to Congress in October 2011, it is estimated that approximately 76,329 veterans experienced homelessness on one night in January 2010. Another estimate stated that 144,842 veterans were homeless on at least one night from October 1, 2009, through September 30, 2010 (Perl, 2012). Research also continues to document the significant prevalence of alcohol and drug abuse among the adult, male, homeless population (Breakey, 1987; Breakey et al., 1989; Burt et al., 2001).

This thesis research fills a gap in the literature on predictors of retention in a treatment program for homeless veterans and can help inform the greater problem of reducing veteran homelessness. The data used in this analysis come from a cohort of homeless veterans who have not before been studied. The VRC at VVSD is a unique program that has served homeless veterans since 1981 but the VVSD has not previously studied which characteristics, evident upon admission, may indicate elevated risk of early discharge and program failure. In doing so, this thesis adds to the body of knowledge

about what predicts success in an intervention program, specifically a program designed to help homeless veterans become self-sustaining and independent.

### **C. RESEARCH QUESTIONS**

The research objective is to determine which demographic characteristics are consistently and significantly associated with treatment phase retention and program completion among homeless veterans with substance use disorders in the VRC program.

- What demographic and other markers are correlated to treatment phase retention and program completion in the VRC?
- How can the risk factors of retention be interpreted and applied by VVSD in order to improve program effectiveness?
- How can the results of this research provide insight to the greater goal of reducing veteran homelessness?

The development of these models was informed by the literature on substance abuse treatment retention, given some of the methodological limitations present in the existing literature with homeless veterans, as well as the fact that very little research on retention has been conducted with homeless veterans in substance abuse treatment. Chapter II reviews the literature on veteran homelessness and the predictors of retention. The variables and methodology for the current research will be discussed in Chapter III. Chapter IV presents the results of this research and Chapter V provides a discussion of these findings.

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## **II. LITERATURE REVIEW**

### **A. INTRODUCTION**

The wars in Iraq and Afghanistan have increased the visibility of the needs of veterans, including the needs of homeless veterans. As the number of Iraq and Afghanistan veterans increase, the numbers of homeless veterans is expected to increase proportionally. Veteran homelessness came to the country's attention in the 1970s and 1980s, when the nation was becoming more aware of homelessness in general. As the homeless population grew, researchers discovered that both male and female veterans were overrepresented in the homeless population. Appendix A provides the legal definition of a "homeless veteran," a distinction that is important when it comes to funding intervention programs.

Rossi (1989) lists many potential causes of rising homelessness, including the demolition of single-room occupancy dwellings, the scarcity of affordable housing, the reduced need for seasonal unskilled labor, and the decreased value of public benefits. Rossi also finds that homelessness likely became more visible when such actions as public drunkenness, loitering, and vagrancy became decriminalized. In addition, veteran homelessness became more widely known to the nation when the media began to highlight the predicament of veterans who had served their country, but were unemployed and homeless (Robertson, 1987). The commonly held belief that military experience provided young people with job training and occupational skills, among other benefits, like maturity and work ethic, conflicted with the observation that veterans were overrepresented in the homeless population.

As mentioned in the previous chapter, HUD estimated that 76,329 veterans experienced homelessness on one night in January 2010. Using data from a sample of 320 communities, Homeless Management Information System (HMIS) researchers estimated that 144,842 veterans were homeless for at least one night from October 1, 2009 through September 30, 2010 (Perl, 2012).

In both the HUD and the HMIS estimates, veterans were overrepresented in the homeless population. According to the HUD estimate, veterans represented 16% of the adult homeless population (compared to 9.5% of the total adult population), and in the

HMIS estimate veterans were about 13% of the adult homeless population (Perl, 2012). Appendix B provides a further discussion of the estimates of the number of homeless veterans.

A primary motivation for researchers has been to explain why veterans are overrepresented among the homeless population. Researchers theorize whether veterans are at greater risk of becoming homeless than their nonveteran counterparts. Refer to Rosenheck et al. (1998) for the most detailed of these studies.

For example, Rosenheck and Fontana (1994) argue that the risk of homelessness among veterans was partially explained by the social selection process that claims early recruits into the all-volunteer military were more likely to have personal characteristics that would later put them at risk for homelessness. During the 1970s, military service was not popular and not very well compensated. Tessler, Rosenheck, & Gamache, (2003) argue that the all-volunteer force (AVF) might have been attractive to some individuals who, in the years following their military service, might find it difficult to integrate in a non-military environment like civilian life. Tessler et al. (2003) argue, “the implementation of the AVF was at a time when recruitment standards were lowered and individuals who joined the military might have been more likely to have characteristics that are risk factors for homelessness” (Tessler et al., 2003, p. 511).

Regardless of the social selection theory, veterans today have high rates of Post-Traumatic Stress Disorder (PTSD) and traumatic brain injury (TBI) caused by combat deployments. These conditions can be even further aggravated with repeated deployments. PTSD and TBI might impact a veteran’s ability to form trusting relationships and could also contribute to substance abuse problems. Furthermore, these conditions can result in a reduced ability to form social relationships among other behavioral problems. These adverse behaviors might contribute to problems with employability, stable relationships and therefore homelessness (Tanielian & Jaycox, 2008).

In response to the problem of homelessness among veterans, particularly the overrepresentation of veterans among the homeless population, the federal government created several programs to fund services and transitional housing specifically for homeless veterans. The majority of programs are funded through the Department of

Veterans Affairs (VA). Within the VA, the Veterans Health Administration (VHA) operates all but one of the programs for homeless veterans. The Veterans Benefits Administration (VBA) operates the other (U.S. Department of Veterans Affairs, 2010). In addition, the Department of Labor (DOL) and HUD also operate programs for homeless veterans.

The VA, through the VHA programs, provides the Health Care for Homeless Veterans (HCHV) program and the Domiciliary Care for Homeless Veterans (DCHV) programs, the Homeless Veterans Reintegration Program (HVRP) and Compensated Work Therapy (CWT) program, and the Grant and Per Diem (GPD) program, as well as other services. Appendix C discusses these federal programs in further depth and Appendix A defines who is eligible for these programs by providing the legal definition of “homeless veteran.”

Finally, preventing and ending homelessness among veterans has become a priority for the current administration as well as the United States Interagency Council on Homelessness and its member agencies. President Obama remarked, “Nobody who serves, nobody who fights for this country should have to fight for a job or a roof over their heads when they come back home” (The White House, 2012). The Obama administration is committed to ending homelessness among veterans within five years. The President’s new campaign of “Zero Tolerance for Homeless Veterans” is consistent with his goal to end homelessness for all Americans (Opening Doors, 2010). Appendix D discusses the VA’s plan to end veteran homelessness, as directed by the President and Appendix E discusses the current progress made toward this goal.

## **B. VETERANS VILLAGE OF SAN DIEGO (VVSD)**

The federal programs that serve homeless veterans authorize the VA, DOL, HUD, and other federal agencies to provide grants to public entities or private, nonprofit organizations in order to provide critical rehabilitative services and transitional housing to homeless veterans. VVSD is one such community-based, veteran-focused organization, and the VVSD VRC program is the focus of this thesis. VVSD is the primary sponsor of this thesis work and the VVSD VRC program will be discussed at length. Appendix F discusses the VVSD organization in depth.

Founded in 1981 by a group of five Vietnam veterans, VVSD is a nationally recognized leader in providing prevention, intervention, treatment, and employment services to military veterans, including returning veterans from Iraq and Afghanistan. Each year, VVSD provides services to more than 2,000 military veterans.

VVSD's VRC is an elective, comprehensive, state-licensed, residential, early-treatment program for homeless veterans who have substance abuse issues. The VRC offers chemically-dependent homeless veterans an opportunity for rehabilitation and recovery in a safe, clean, and sober village-like setting. Formulated as a social model, VRC is integrated with structured case management and mental health therapy, and simultaneously addresses addiction, mental health, medical, legal, and employment issues for homeless veterans. The three phases of the VRC program include Recovery Services, Employment Development, and Community Reintegration (A National Commitment, 2009).

The first 30 days of the VRC is called the Assessment phase. During this phase, clients are evaluated and observed to determine precise program needs. In Phase 1, clients become part of a community of approximately 165 other veterans, each working toward recovery from alcoholism and/or chemical addiction. Phase 1 has a prescribed structure, and is designed to last between 90 and 120 days. Clients are required to attend classes and group meetings that address Alcohol and Drug Education, Anger Management, Healthy Relationships, Family Dynamics, Personal Boundaries, Journaling, Changing Criminal Behavior, and a 12-Step Education sequence in both Alcoholics Anonymous (AA) and Narcotics Anonymous (NA). Each client meets with his or her assigned Counseling Process Group (Home Group) at least weekly. VRC clients are expected to attend 12-Step meetings in the evenings, with a goal of attending 90 meetings in 90 days (see [www.vvsd.net](http://www.vvsd.net)).

The remaining two phases in the VRC program are equally important but have less formal structuring than the Assessment Phase and Phase 1. In Phases 2 and 3, clients receive job search and job application skills. They complete a comprehensive employment course and are attend weekly meetings in support of their treatment from Phase 1. Clients seek to secure employment opportunities and continue to work with their sponsors in 12-Step recovery and make final preparations for full reintegration into

society. Clients seek to secure viable employment opportunities and prepare for the challenges of staying sober, remaining mentally and physically stable, and living independently after graduation from VVSD. Upon completion of all phases (Assessment Phase and Phases 1 through 3), clients are invited to graduate the VRC (see [www.vvsd.net](http://www.vvsd.net)).

This intervention model has been replicated in dozens of U.S. cities and is nationally recognized as a near-optimal intervention solution to assist homeless veterans. Appendix G amplifies the VRC program with program details and objectives. The VRC tries to maintain no more than a 12-to-1, client-to-case manager ratio. This constraint, coupled with other physical space limitations on the VVSD campus, restrict the number of homeless veterans who can be invited to participate in the program each year. Although the VRC has a rolling acceptance policy, where homeless veterans may apply for admission throughout the year, the largest cohort of VRC intakes occurs in July, during a major VVSD-sponsored event called Stand Down (A National Commitment, 2009).

### **C. STAND DOWN**

In a strictly military sense, the term “Stand Down” refers to the time when troops are removed from danger and taken to a safe area to rest, eat, clean up, receive medical care, and recover from the turmoil of battle. Stand Downs for homeless veterans are when local veterans service organizations, businesses, government entities, and other social service organizations assemble in one place for up to three days to provide services for homeless veterans. Stand Downs provide a unique opportunity for homeless veterans to obtain nourishment, clothing, hygiene care, medical care, dental care, immunizations, legal assistance, employment counseling, drug and alcohol referrals, and, in the multiday model, shelter. The first Stand Down for homeless veterans was organized by VVSD and held in San Diego, California in 1988. The event has since been replicated in over 20 different states and more than 200 Stand Downs take place across the country every year, based on VVSD’s model (see [www.vvsd.net](http://www.vvsd.net)). In 2009, the *New York Times* did a feature article on the Stand Down program at VVSD. That article can be found at [www.nytimes.com/2009/07/26/us/26homeless.html](http://www.nytimes.com/2009/07/26/us/26homeless.html).

Held over a July weekend near Balboa Park in San Diego, the VVSD Stand Down provides services and shelter to about 1,000 homeless veterans each year. In addition to this, VVSD uses their Stand Down to invite about 30–40 chemically dependent homeless veterans into the VRC Program each year. VVSD case managers and rehabilitation specialists try to invite homeless veterans who have the greatest need for intervention. Veterans are invited based on their intake survey, a personal interview, and the veteran's display of personal motivation for recovery. It is during this interview process that the VVSD VRC leadership might benefit from the results of this thesis work.

Almost instantaneously, homelessness ends for these select veterans and they are afforded a unique opportunity for recovery. The uncertainty of success, however, remains a significant consideration. Although VVSD prescreens applicants and collects detailed demographic information, the client data has never been analyzed in any meaningful way to identify premature discharge risk factors. While some homeless veterans fully rehabilitate, secure employment, and find permanent housing, other veterans struggle in the program and discharge prematurely, despite the depth and breadth of services provided. Prior to this thesis research, nothing was known about the specific client characteristics associated with retention of clients in the VVSD VRC program. The results of this thesis now enable VVSD case managers to identify high-risk veterans and make targeted interventions to help them complete their treatment.

#### **D. CONTINUUM OF CARE (COC) MODEL**

The CoC model, like the one at VVSD, has served as the leading homeless service delivery standard for most of the past two decades (Wong, Park, & Nemon, 2006). Key components of this approach include homelessness prevention strategies, provisions for outreach services, emergency shelter, transitional housing, and permanent supportive housing (Burt, Pollack, Sosland, Mikelson, Drapa, & Greenwalt, 2002). A CoC is considered a single homeless service system that covers a particular geographic area. It is usually supported by government grants and community-based partners. The services attempt to match each individual's needs and maximize self-sufficiency (Burt et al., 2002). See Appendix H for a discussion of the CoC model and an alternative model called the Housing First model.

As described in Appendix H, the goal of the VRC at VVSD is abstinence from drug and alcohol use, and social and vocational rehabilitation via a CoC approach that combines 12-Step recovery principles with education, group counseling, individual counseling, therapy, job training, and referral. Successful VRC program completion typically requires 12 months and is attained when a resident completes all treatment components (demonstrates competency in the core cognitive behavioral skills, completes vocational training courses, reaches personal change goals set forth in the individualized treatment plan, etc.), is able to obtain stable employment and housing, and has reached a level of financial stability sufficient to support independent living. Residents who achieve these goals and remain abstinent from substances are invited to “graduate” the VRC. During their tenure in the VVSD VRC program, in addition to the substance abuse treatment provided, clients receive a range of case management services, including referrals for employment, housing, medical and dental treatment, and spiritual care. They are also provided with educational opportunities, legal services, and employment counseling.

#### **E. HOMELESS MANAGEMENT INFORMATION SYSTEM (HMIS)**

The HMIS is an electronic data collection system that stores information about people who access the homeless services system in a Continuum of Care. HMIS data can be used to understand the needs of the homeless population at the local, state, and national levels. Much like the purpose of this thesis, HMIS data can help CoCs improve case management by collecting and analyzing client information.

HUD supports the local HMISs by providing funding and mechanisms for data collection and analysis to CoCs (in the case of this research, Father Joe’ Villages and VVSD in Southern California). As part of this effort, HUD publishes and revises the HMIS Data and Technical Standards (HMIS Standards) that allow for the collection of standardized client- and program-level data on homeless service usage among programs. The American Recovery and Reinvestment Act of 2009 identified the HMIS as the primary tool for the collection of data on the use of funds awarded to homeless service providers. The HMIS Standards document (relevant excerpts provided in Appendix I) gives the precise variable definitions for the client population used in this thesis.

Homeless service providers, like VVSD, rely on the HMIS to conduct case management, produce in-depth reporting, and perform other important information management tasks. The HMIS aggregates data that is captured in the Client Service Tracking and Reporting (CSTAR) system, a separate database that was created by Father Joe's Villages, a multiagency organization that is the largest provider of homeless services in both San Diego and Riverside Counties. CSTAR is the predominant system used by the VVSD to collect client information and data. As discussed in Appendix I, HUD uses HMIS information for several reporting requirements such as the Annual Homeless Assessment Report (AHAR), which is provided to Congress.

#### **F. PROGRAM RETENTION**

Perhaps the most accepted finding in research on substance use treatment is that early attrition is associated with poorer outcomes. Conversely, program retention correlates to success in substance abuse treatment programs (De Leon, 1991). The literature also consistently finds attrition to be very common. Dropout rates can 50% in drug-free residential and outpatient settings or worse (Alterman, McKay, & Mulvaney, 1996; Ball et al., 2006). Many researchers have placed a priority in assessing client and treatment program factors that are associated with early attrition (Battjes, Onken, & Delany, 1999).

Much of the literature on client characteristics associated with attrition from inpatient or outpatient drug-free treatment suggests that younger age, African-American race, unmarried status, poor family functioning, poor motivation/readiness, and fewer years of education are associated with higher attrition rates (O'Connor et al., 2003). Agosti, Nunes, and O'Connell (1996) found that several potential demographic factors related to dropout include male gender, minority status, and younger age. These researchers also concluded that an earlier onset of substance abuse are associated with higher risk for attrition from both inpatient and outpatient settings. Other research on attrition suggests that premature discharge was associated with younger age, less education, and more serious substance abuse or psychiatric disorders (Wenzel et al., 1995). Furthermore, educational attainment, an indicator of or proxy for socioeconomic



status, may enable a better understanding of treatment needs and goals, which can enhance cooperation and compliance with treatment guidelines (Wenzel et al., 1995).

A large body of literature suggests that age corresponds to retention in substance abuse treatment. The same is true among homeless clients. Wenzel et al. (1995) found that younger clients were more likely to receive a premature discharge than older clients, and Grella (1993) reported that younger clients were more likely to reject treatment entry than older clients. Younger clients stay in treatment for shorter periods of time, while older clients often remain in treatment longer and are more likely to initiate treatment on their own. As a result, their retention rates are higher (Drymalski, 2009). Older age seems to be one of the most consistent predictors of positive outcomes.

Claus and Kindleberger (2002) found that a range of co-occurring mental illnesses have been related to early attrition. Justus et al. (2006) concluded that homeless clients diagnosed with a personality disorder and psychiatric treatment had higher rates of treatment attrition than those without such a diagnosis or treatment history. Similarly, Cook et al. (1994) found that severe psychiatric disorders, including anxiety and depression, are associated with high attrition.

Very little research has been conducted to determine the influence of personal motivation on treatment retention among homeless, substance-abusing clients. Only one study, Erickson, Stevens, McKnight, and Figueredo (1995), examined the influence of motivation on retention. As would make sense, motivation was found to be positively correlated with treatment retention.

Given the research on predictors of attrition among substance-abusing clients, much less is known regarding the predictors of retention among homeless, substance-abusing clients. An excellent summary of what is known can be found in chapter two of Drymalski (2009).

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### **III. METHODOLOGY**

#### **A. OVERVIEW**

This chapter describes the thesis methodology, a retrospective logistic regression analysis of existing VVSD data. It includes a description of the data; a discussion of the data analysis plan, including response category collapsing decisions; and model building strategies for the two models of this research. The first model is called the Treatment model and is designed to determine the theoretical probability of failing the VRC Treatment Phase (up to 150 days) based on the most statistically significant predictor variables among every available client record. The second model is called the Graduation model is designed to determine the theoretical probability of failing the VRC program (after 150 days) based on the most statistically significant predictor variables among the clients who succeeded in the Treatment Phase of the VRC. The chapter concludes with a discussion of the approach and formulation of a simple decision support tool from the findings of this research to help VVSD leadership to quickly apply the findings of this research.

#### **B. THE DATA**

Baseline data were obtained at time of admission via face-to-face interviews designed specifically for admissions into the VRC program. Data were recorded in the CSTAR program software at the time of program entry. As was mentioned earlier, HUD has supported the development of local HMISs by providing technical support and funding to CoCs like VVSD, and helping them collect HMIS data. The dataset analyzed in this thesis is a subset of client information in the HMIS. For the purpose of this thesis, VVSD provided three full calendar years of client discharge data from the VRC: 2009, 2010, and 2011.

Before discussing specific approaches in methodology, it is important to reiterate that the overall goal of this thesis is to assess the value of a specific set of client variables in predicting treatment phase retention and overall program completion of an intervention treatment program for homeless veterans. The data set that formulated the basis of this

thesis had several pretreatment client variables and two response variables. The two response variables corresponded to a binary outcome of treatment success and a binary outcome of program completion.

## **1. Data Set**

The data set consists of a total of 680 veterans (57 females, 623 males) who were discharged from the VVSD VRC program between the start of calendar year 2009 and the end of calendar year 2011. For example, the first client discharge occurred on January 7, 2009, and the last client discharge occurred on December 30, 2011. It is important to note here that clients who discharged in 2011 did not necessarily stay in the program longer than clients who discharged in 2009. Each client date of admission varied across years and was compared with date of discharge to determine their overall length of stay in the program.

In many clinical studies the time until the occurrence of an event, such as length of stay in the VRC treatment program, is the main outcome of interest. When the cohorts under study are defined in terms of when they enter the study, it is often the case that not all the subjects will have experienced the outcome of interest at the end of a given time period. This is called “censoring,” meaning that the observation period ended without observing the outcome of interest because the time period expired first. This thesis avoids the issues associated with censored data by defining cohorts by their exit times, and thus by definition there is no censoring in this data. For this thesis, 227 clients discharged from the VRC in 2009, 234 clients discharged in 2010, and 219 clients discharged in 2011. Because length of stay in treatment will become a critical response variable, clients who did not have discharge date information were not included in the current thesis.

The data set of 680 records does not include 36 clients (4 in 2009, 14 in 2010, and 18 in 2010) who transitioned to another form of supportive treatment. For example, several clients transitioned from the VRC to other homeless intervention programs in San Diego County such as New Resolve, Family Living, and Sober Living. These 36 client records were dropped from this research for three reasons. First, these records would not have considerable value for intervention efforts for VVSD. Second, they would likely

skew modeling results if they were coded as program successes or failures. Finally, these clients have yet to have an observable endpoint in a homeless treatment program per the previous discussion. These 36 client records represent censored data and were dismissed. After these adjustments, a total of 680 client records comprised the final dataset.

Of the 680 records that remained, and to the extent that each client had complete information for each data element category as prescribed by HMIS standards, each client had information on Gender, Age at Check-In, Race, Ethnicity, Veteran Status, Disabling Condition, Residence Prior to Program Entry, Zip Code of Last Permanent Address, Program Entry Date, Program Exit Date, Physical Disability, Developmental Disability, Chronic Health Condition, Mental Health Condition, Substance Abuse, Victim of Domestic Violence, Education, Length of Stay in Days, and Reason for Leaving. Appendix I provides a full discussion of the HMIS prescribed data elements, as well as detailed definitions and response categories for each element.

The client variables that comprise the VRC dataset for this thesis can be divided into two broad categories: input variables and response variables. Input variables can be divided into three categories: veteran characteristics, program characteristics, and substance abuse and health information.

Veteran characteristics included Gender, Race, Ethnicity, Veteran Status, Age at Check-In, and Education. Program characteristics included Residence Prior to Program Entry, Zip Code of Last Permanent Address, Program Entry Date, and Program Exit Date. Finally, substance abuse and health information included Disabling Condition, Physical Disability, Developmental Disability, Chronic Health Condition, Mental Health Condition, Substance Abuse, and Victim of Domestic Violence.

Response variables included information that was captured upon discharge from the VRC: Length of Stay and Reason for Leaving. The response variable information provided the basis for the output variables in both the Treatment and the Graduation models.

One important note of interpretation—the data captured in the VRC dataset and the greater HMIS reports is generated from client self-reporting and can rarely be validated. Self-reported information can often threaten the validity of research and impede the development of theories in organizational human behavior. Truthful

responses or evaluating the truthfulness of a client's response, however, is not a central priority for this research and does not significantly impact model generation. The goal of this thesis is to seek good predictors using self-reported data and not necessarily the truth of a veteran's situation. Bearing this in mind, this thesis will take client responses on face value and interpret the responses as adequate predictors, rather than the truthfulness of the responses themselves.

What follows is a discussion regarding how the data were prepared for analysis, including how missing data was handled and how variable categories were defined in order to achieve best model practices. The same general strategies of imputation and variable consolidation were utilized for both the Treatment and Graduation models.

## **2. Missing Data**

There are several methods to handle missing data. Some of these methods, referred to in the statistical literature as imputation, include mean value imputation, hot-deck imputation, multiple imputation and others. While imputation can be useful in some analytic methods and models, for this analysis it was important to preserve the "Don't Know/Missing" responses for two reasons. First, the existence of this type of "data" may be informative in and of itself. Second, case managers are not interested in imputed values but rather in the actual values (including whether those values are missing) of the individual clients. Hence, throughout this analysis the Don't Know/Missing data was maintained as such and the Don't Know/Missing category was carried through as a variable level in the models.

## **3. Variables and Defining Variable Categories**

The appropriate definition of categories for variables can increase the predictive power of a regression model. This involves the combination of similar values and the consequent reduction in the total number of categories of the variable. Variable category definitions are described as each client variable is discussed and summarized below.

### ***a. Independent Variables***

- *Gender.* 623 Males, 57 Females; 680 total records. No missing information.

- *Race*. According to HMIS standards, race has five possible response types; American Indian or Alaska Native, Asian, Black or African-American, Native Hawaiian or Other Pacific Islander and White. Due to the infrequent responses in the categories of American Indian or Alaska Native; and Asian, Native Hawaiian, or Other Pacific Islander, the data was collapsed to formulate a modified Race variable with only three categories: White, Black, and Other. In the end, this variable contained 466 White subjects, 176 Black subjects, and 38 Others.
- *Ethnicity*. 91 Hispanic/Latino, 589 Non-Hispanic/Latino; 680 total records. No missing data.
- *Veteran Status*. True 680. No missing data.
- *Age at Check-In*. Minimum of age 21. Maximum of age 81. Mean age of 46. No missing data. This continuous variable permitted generous flexibility in choosing two (or more) age bins that might result in statistical significance to the logistic regression models. After experimenting with several categories and various category sizes, age did not prove to be a statistically significant variable regardless of any binning strategy.
- *Education*. Highest Grade Completed. Post-Secondary Education. Between these two HMIS categories there were several ways to combine and consolidate education categories. After thorough experimentation, these two variable categories were combined to formulate four education categories: Some College, High School Diploma/General Education Development (HS/GED), Less than High School Education, and Don't Know. The distribution from the collapsed fields is as follows: 54 Some College, 440 GED/HS Diploma, 24 Less than HS Education, and 162 Don't Know.
- *Residence Prior to Program Entry*. HMIS responses to this data element are include in Appendix I, but due to some response element infrequencies, this variable was collapsed into five categories:

1. Emergency Shelter/Hotel/Motel/Family/Friend/Transitional Housing for homeless persons;
2. Hospital (Psychological or Physical condition)/Substance abuse treatment facility or detox center;
3. Jail, prison, or juvenile detention facility;
4. Place not meant for meant for habitation; and
5. Missing or Other.

The distribution of these categories is as follows: 94 Emergency Shelter/Hotel/Motel/Family/Friend/Transitional Housing for homeless persons; 247 Hospital (Psychological or Physical condition)/Substance abuse treatment facility or detox center; 91 Jail, prison, or juvenile detention facility; 115 Place not meant for human habitation; and 133 Missing or Other.

- *Zip Code of Last Permanent Address.* Clients reported their zip code of last permanent address; 618 clients reported a zip code, 62 clients did not. This field was not used in the analysis.
- *Program Entry Date.* No data imputation or collapsing required. No missing data.
- *Program Exit Date.* As discussed above, clients who did not have program exit information were removed from the current dataset.
- *Disabling Condition.* True 678; False 2. No missing data.
- *Physical Disability.* True 107; False 506; Don't Know/Missing 67.
- *Developmental Disability.* True 27; False 585; Don't Know/Missing 68.
- *Chronic Health Condition.* True 93; False 519; Don't Know/Missing 68.
- *Mental Health Condition.* True 352; False 294; Don't Know/Missing 34.
- *Substance Abuse.* True 679; False 1.
- *Victim of Domestic Violence.* True 24; False 642; Don't Know/Missing 14.



***b. Response Variables***

*Length of Stay.* Length of Stay indicates the number of days that a client remained in the VRC program. It is calculated by determining the difference between the Program Exit date and the Program Entry date. Length of Stay ranged from a minimum of 1 day to a maximum of 805 days, with a mean of 207.6 days. Length of Stay in days is an important, continuous variable and the single indicator variable that was coded to become the binary output response variable for the Treatment model. The treatment phase of the VRC program has a prescribed 120-day syllabus with mandatory modules, meetings, activities, and programmatic goals. The treatment phase typically lasts between 120 and 150 days. See Appendix G for a full discussion of the VRC program. After consultation with VRC case managers at VVSD, 150 days is a more realistic choice to allow for a client to repeat up to 30 days of work in the treatment phase. If a client's length of stay is less than 150 days, then that client was not successful in the Treatment phase and instead exited early. If a client's length of stay is greater than or equal to 150 days, that client completed the treatment portion of the VRC program and was successful. This Completion and Exit information is the binary output variable for which the other client variables are predicting.

*Reason for Leaving.* This is the single indicator variable that was coded to become the binary output response variable for the Graduation model. The HMIS prescribed data elements included the following response categories for Reason for Leaving: Acquired Housing, Completed Program, Missed Bed Check, Moving out of State, Noncompliance with 90 day requirements, Noncompliance with Behavioral Contract, Noncompliance with Case Plan, Noncompliance with Drug/Alcohol Policy, No Show, Nonpayment of SLE, Reached Maximum Allowable Stay, Ready to Leave, Refused to Participate, Severe Rule Violation, Unable to Conduct Exit Interview, and Unknown.

The first important observation in these response categories is to note the similarities that exist among the responses. The first intuitive cluster is to group the clients who left the VRC program and transitioned to another treatment or intervention program. As previously discussed, these clients transitioned out of the VRC program, but each client was tracked, monitored, and managed by another program designed to provide

housing support services. For this reason, if a client responded with a Reason for Leaving that included Transition to 24th Street, Transition to Family Program, Transition to Sober Living, or Transition to St. Vincent/VVSD, then these client records were dropped from the current dataset.

The response category response of Completed Program for Reason for Leaving is coded as success or PASS. These clients successfully completed all phases of the VRC treatment program, attained treatment goals, and successfully transitioned out of the VRC Program. This accomplishment is the ultimate goal of the VRC program and the case managers who operate it. These clients provide the example for other veterans to follow in the VRC.

Of the remaining category responses, Acquired Housing is the next Reason for Leaving that requires discussion. After consultation with VRC case managers at VVSD, clients who left the VRC program and responded that their reason for leaving was Acquired Housing were clients who secured Section 8 vouchers through the HUD-VA Supportive Housing (HUD-VASH) program. As discussed in Appendix C, the HUD-VASH is a collaborative effort between the VA and HUD. HUD provides housing to homeless veterans through a set of Section 8 vouchers and the VA provides supportive services. The program targets veterans with severe psychiatric or substance-use disorders, where local Public Housing Authorities (PHAs) administered the Section 8 vouchers, while local VA medical centers provided case management and clinical services to participating veterans. Additionally, the clients in the current data set who indicated that their reason for leaving was due to Acquired Housing each had a length of stay longer than 180 days in the VRC program, which implies treatment success and significant work toward program graduation. Finally, these clients would still be eligible to take advantage of other VVSD programs for substance abuse issues and employment support. For these reasons, the Acquired Housing responses were also coded as success or PASS.

Finally, all remaining responses in the Reason for Leaving category are coded as failure or EXIT. The remaining response categories are: Missed Bed Check, Moving out of State, Noncompliance with 90 day requirements, Noncompliance with Behavioral Contract, Noncompliance with Case Plan, Noncompliance with Drug/Alcohol Policy, No Show, Nonpayment of SLE, Reached Maximum Allowable Stay, Ready to

Leave, Refused to Participate, Severe Rule Violation, Unable to Conduct Exit Interview, and Unknown. In each of these cases, clients officially exiting a treatment system are no longer traceable. Additionally, clients left of their own volition or did not comply with program requirements as outlined during the VRC orientation period. For the purpose of this model, these discharges were coded as failure or EXIT.

## C. MODELING

The models for predicting VRC treatment completion and VRC program completion are based on logistic regression techniques. Logistic regression is a standard statistical technique for modeling data with binary outcomes, such as whether or not a client passed or failed a program (i.e., a homeless intervention treatment program like the VRC). It is appropriate when the dependent variables are either continuous or categorical in nature (or both).

### 1. Logistic Regression

Detailed discussions and the mathematical development of the technique can be found in textbooks such as those authored by McCullaugh and Nelder (1989) or Hosmer and Lemeshow (1989). The basic form of the model is

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 x_1 + \cdots + \beta_n x_n, \quad (1)$$

where, for example,  $p$  is the probability that a client will fail to complete the treatment phase of the VRC for the Treatment Model. The ratio of  $p/(1 - p)$  is referred to as the “odds.” The  $\beta$  coefficients in the model represent the change in the log odds for a unit change in an  $X$  variable. The  $X$  variables capture the various demographic or other characteristics of the population. In logistic regression, the log odds are assumed to be a linear function of various covariates.

Through algebraic manipulation, the estimated failure rate,  $\hat{p}$  can be expressed as a function of the coefficients:

$$\hat{p} = \frac{\exp(\hat{\beta}_0 + \hat{\beta}_1 X_1 + \cdots + \hat{\beta}_n X_n)}{1 + \exp(\hat{\beta}_0 + \hat{\beta}_1 X_1 + \cdots + \hat{\beta}_n X_n)}. \quad (2)$$

With the ability to calculate  $\hat{p}$  for the given  $\hat{\beta}$  values for each statistically significant variable in the model, a matrix of Failure Rates is easy to calculate.

## **2. Model Building Strategy**

A deliberate parsimonious approach was used to build the models. A parsimonious model is one that has the simplest plausible model, with the fewest possible number of variables. The widely accepted technique of stepwise variable selection was used to find the best subset of predictor variables. The technique applies to logistic regression model building as well.

Additionally, interaction terms among variables were also considered in this model building process. In this thesis, interaction terms were tested for significance and included only if there was reason to believe that the relation between a predictor and an outcome variable is dependent on the level of another predictor variable. Caution was used because the large numbers of variables make the possible number of interaction terms quite considerable. Inclusion of these terms in the model can consume degrees of freedom and can make the model less likely to generalize to the wider population of interest. For this thesis, only those interaction terms that are theoretically relevant were tested and, in fact, while many combinations were tested, none remained in the final models.

The model building approach of this thesis also considers the notion of overfitting. Overfitted models will not consistently replicate in future samples because they are too precise. Overfitting and generalization of the models become relevant when discussing the ability of any model to predict future outcomes. An overfit model is one that has too many significant covariate terms and an underfit model is one that has too few. The mechanism that drives the number of covariate terms in a given models rests with the model builders subjective choice of the p-value.

In sum, a balanced approach was used to select statistically significant variables, one that gave consideration to best theoretical practices and statistical algorithms, particularly for variables thought to have real-world, practical relevance for homeless service providers.

## **3. Setting the Significance Level**

In statistical hypothesis testing, a  $p$ -value is the probability of obtaining a test statistic at least as extreme as the one that was actually observed, assuming that the null

hypothesis is true. Researchers “reject the null hypothesis” when the  $p$ -value is less than a pre-specified significance level  $\alpha$ , which is usually set to 0.05 or 0.01. When the null hypothesis is rejected, the result is said to be statistically significant.

For this thesis, the significance level was chosen that resulted in a set of covariate choices that had the most predictive power for future datasets. This approach, which is a form of cross-validation, determines the generalizability and overall utility of prediction models, based on various significance level choices.

To assess the predictive power of the model, the dataset was divided into two parts: client discharges in 2009 and 2010 as a group, and client discharges in 2011. A Treatment model was then fit to the 2009–2010 data and its predictive power assessed with the 2011 data. In doing so, this thesis examined two different significant levels. Model 1 uses a significance level of 0.05, and model 2 uses a significance level of 0.01.

For the 2009–2010 Treatment model with  $\alpha = 0.05$  (2009–2010 Model 1), the variables found to be significantly related to Treatment outcome were: Education, Mental Health, Prior Residence, Chronic Homelessness, and Chronic Health Condition. For the 2009–2010 Treatment model with  $\alpha = 0.01$  (2009–2010 Model 2), the variables found to be significantly related to Treatment outcome were: Mental Health and Prior Residence.

Then to determine how well each model predicts the 2011 data in order to select the appropriate significance level, three approaches were used: (1) comparing the aggregate expected number of exits to the actual number of exits, (2) comparing the individually predicted number of exits to actual number of exits, and (3) model parsimony.

Using the first approach, the 2009–2010 Model 1 produced an expected number of exits of 110.85, compared to 95 actual exits. Therefore, the 2009–2010 Model 1 over-predicted by almost 16 people. By contrast, the 2009–2010 Model 2 produced an expected number of exits of 109.029, compared to 95 actual exits. Therefore, the 2009–2010 Model 2 over-predicted by only 14 people. This suggests that the 2009–2010 Model 2 may be better and 0.01 is a more appropriate significance choice. Using the second approach, the 2009–2010 Model 1 correctly predicted 55% of exits in 2011 and the 2009–2010 Model 2 also correctly predicted 55% of exits in 2011. Given the

similarities with both models, the slightly better predictive power of Model 2 and the consideration of the most parsimonious model, it was decided that that  $\alpha = 0.05$  was too high while  $\alpha = 0.01$  might be a bit too low. As a result, a slightly more moderate significance level of  $\alpha = 0.02$  was chosen for fitting the three-year (2009–2011) Treatment model.

As was mentioned above, should the logistic regression analytic models (Treatment model and Graduation models) demonstrate poor fits with the data, then a more parsimonious analysis will be conducted. In the end, the final models will only include those variables with statistically significant covariates at the  $\alpha = 0.02$  significance level. All data was analyzed using the Statistical Package JMP Pro 10 computer program developed by the Statistical Analysis System (SAS) institute.

## IV. RESULTS

### A. SUMMARY STATISTICS

Among the 680 records that comprised the final data set for this thesis, clients, on average, were 46 years old, overwhelmingly male (91.6%), primarily white (68.5%), and from a non-Hispanic ethnicity (86.6%). All the clients reported that they were veterans and all but one reported having a substance abuse problem.

Most clients had a GED or HS diploma (64.7%), while almost one in four (23.8%) reported that they didn't know. Less than 10% reported that they had some college or postgraduate education; see Figure 1.

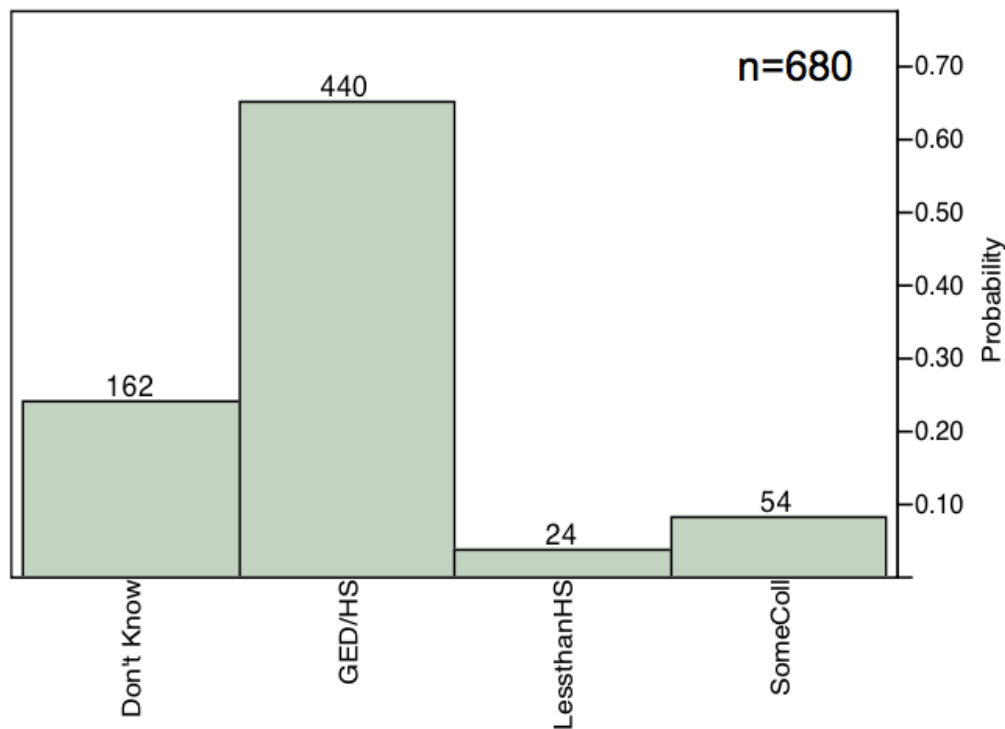


Figure 1. Client Education Information

Most clients' previous residence immediately prior to admission into the VRC was from some form of treatment facility to include a hospital (psychological or physical condition), substance abuse treatment facility, or detoxification center. This finding suggests that part of the total rehabilitation process could involve multiple episodes of

treatment and possibly a high degree of transition among programs, possibly due to client frustration and different requirements among certain types of programs; see Figure 2.

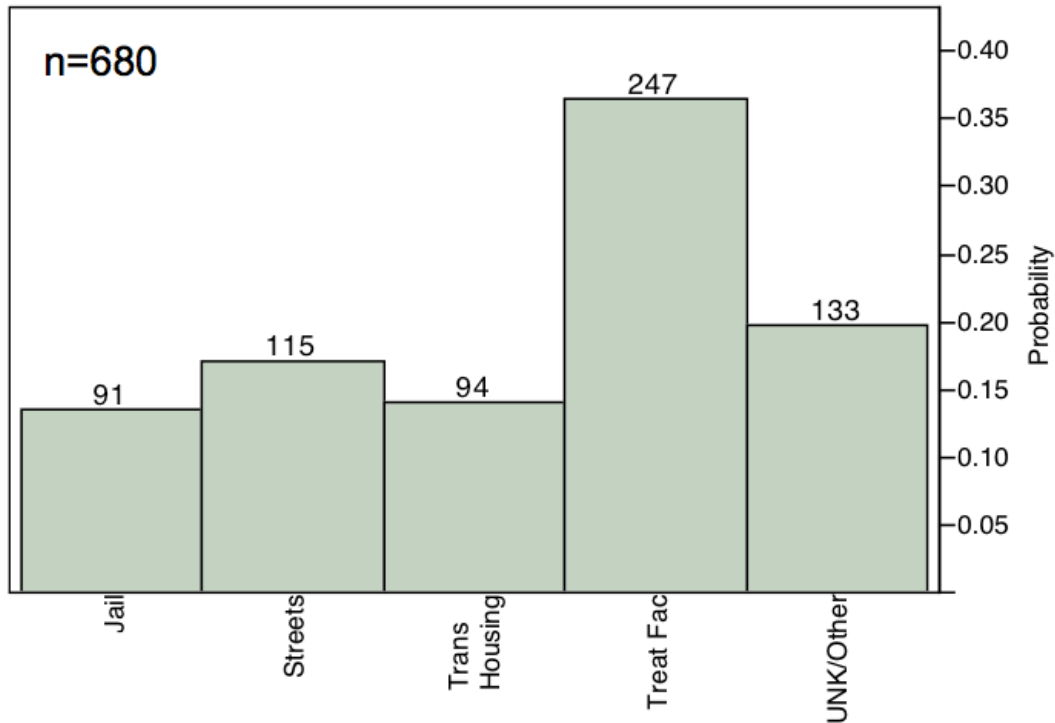


Figure 2. Client Prior Residence Information

Overall, 99.7% of clients reported to have a Disabling Condition. Almost one in six clients reported that they had a Physical Disability (15.7%) compared to 74% who reported that they did not have a physical disability. Only 4% of clients reported that they had a Development Disability compared to 81.6% who reported that they did.

Additionally, 13.6% of clients reported that they had a Chronic Health Condition compared to 76.3% of clients who reported no Chronic Health Condition. By contrast, the majority of clients (51.8%) reported to have a Mental Health problem compared to 43% who said they did not. Only 5% of clients reported that they Didn't Know if they had a Mental Health problem. Most clients (94.4%) reported that they were not a victim of domestic violence.

Overall, 384 of 680 (56%) clients remained in treatment at least 150 days to complete the official Treatment portion of the VRC program. 290 of 680 (42.6%) of clients successfully completed the entire VRC program. Program completion success



conditioned on Treatment success, however, was considerably higher. Of the clients who did complete the Treatment portion of the VRC program, 266 of 384 (69%) went on to graduate and complete the overall VRC program. These findings are consistent with the literature as discussed in Chapter II. Orwin et al. (1999) found that structured programmatic components appeared to be associated with longer lengths of stay or greater rates of program completion for homeless clients. For example, programs that offered some type of housing or living facilities, such as a therapeutic community, residential treatment program, or a program that offered transitional housing as part of its service package (all characteristics of the VRC program at VVSD), appeared to have some of the highest rates of retention.

As will be discussed, indicators for the presence of a mental health condition among clients proved to be a risk factor for premature treatment exit. Clients who reported that they had a Mental Health problem had a 48% success rate at the 150-day mark of VRC treatment as opposed to those that reported no mental health problem (65% success) or those that didn't know (68% success). These findings are consistent with the literature as discussed in Chapter II where, for example, Justus et al. (2006) suggested that homeless clients with a history of psychiatric treatment remained in treatment for a shorter length of time and were less likely to complete the program than those homeless clients without a history of psychiatric treatment.

Conversely, a positive chronic health condition contributed to Treatment success. Clients who reported they had a Chronic Health Condition had a 67% success rate at the 150-day mark of VRC treatment as opposed to those that reported no chronic health condition (55% success) or those that didn't know (50% success).

Additionally, clients who reported that their residence immediately prior to gaining admission to the VRC was from the Streets or a place not meant for human habitation had a 61.7% success rate for Treatment. Clients who reported that their prior residence was a treatment facility that included a hospital (psychological or physical condition), substance abuse treatment facility, or detoxification center had a 62% success rate for Treatment. Conversely, success rates were considerably lower for clients whose prior residence was Jail (53%), Transitional Housing (52%), or unknown (46%).

The Length of Stay of clients in the VRC ranged from 1 day to 805, days with a mean of 207.6 days; see Figure 3.

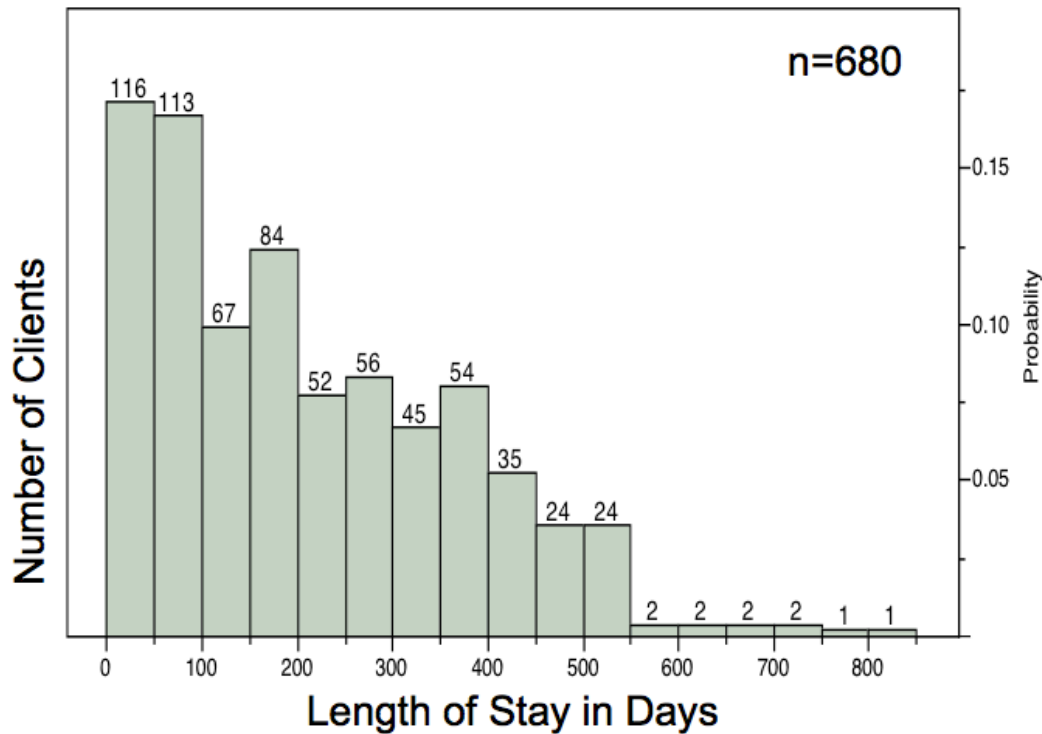


Figure 3. Client Length of Stay in Days

As discussed in Chapter II, the literature shows that a key determinant of the success of programs like the VRC is the ability of these programs to retain clients in treatment (Justus et al., 2006). Other studies suggest that duration of treatment is a better predictor of successful outcomes than is the amount or intensity of the treatment provided (Moos & Moos, 2003). The findings of this thesis are consistent with the literature. Among the clients who remained in the VRC beyond 150 days, and according to the definitions in Chapter III, the overall program successes were correlated with longer lengths of stay and the overall program exits were associated with shorter lengths of stay, as shown in Figure 4.

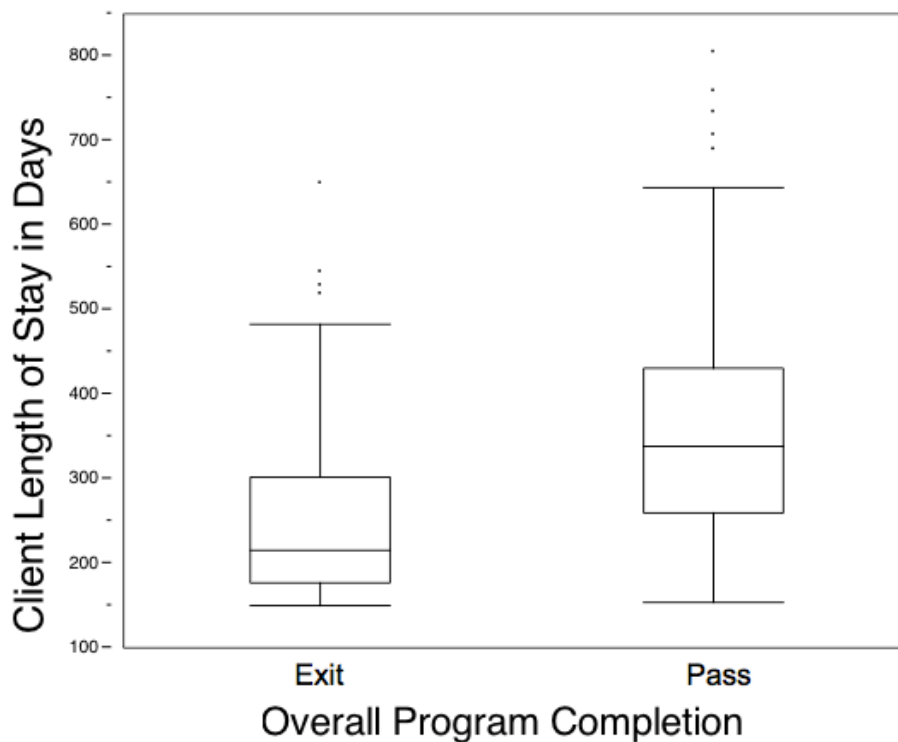


Figure 4. Box and Whisker Plot of Program Exit and Pass

As discussed above, 266 of 384 (69%) clients who did complete the Treatment portion of the VRC program went on to graduate and complete the VRC. Clients who reported that their residence prior to the VRC was Jail, however, had a considerably higher success rate. Among the 384 clients who remained in the VRC for 150 days or longer, 49 (12.7%) reported to have come from Jail; 71 (18.4%) reported to have come from the Streets, 49 (12.7%) reported to have come from Transitional Housing, 154 (40%) reported to have come from a Treatment Facility, and 61 (15.8%) reported that they did not know.

Of the 49 clients who reported to have come from Jail prior to the VRC, 81.6% of them (40 of 49) completed the VRC and graduated, compared to a 70% success rate for clients from the Streets, 65% from Transitional Housing, 72.7% from a Treatment Facility, and 52% who reported Unknown.

## B. TREATMENT AND GRADUATION MODEL RESULTS

For the 2009–2011 Treatment model with a significance level of 0.02, the statistically significant covariates for Treatment outcome are: Mental Health = Yes; Chronic Health Condition = Yes; Prior Residence = Street or Prior Residence = Treatment Program. More specifically, Mental Health = Yes contributes to Treatment failure, where Chronic Health Condition = Yes contributes to Treatment success and Prior Residence = Street or Prior Residence = Treatment Program contribute to Treatment success. Figure 5 shows the model coefficients and their statistical significance.

A similar approach to building the Graduation model was used, only this time a significance level of 0.01 was used. The statistically significant covariates for Graduation outcome are: Length of Stay and Prior Residence = Jail. More specifically, longer Length of Stay contributes to Graduation success and Prior Residence = Jail contributes to graduation success. Figure 5 shows the model coefficients and their statistical significance.

Covariate	Treatment Model Coefficients	Graduation Model Coefficients
Health conditions		
Mental health = Yes	0.716 ***	
Chronic health = Yes	–0.596 *	
Prior living situation		
Street	–0.487 **	–0.512
Treatment program	–0.487 **	–0.614
Temporary housing		–0.039
Jail		–1.308 **
Length of stay (after VRC)		–0.008 ***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Figure 5. Treatment and Graduation Model Results

## C. SCORING SCHEME FOR TREATMENT MODEL

Understanding and interpreting the major risk factors of failure rates (premature treatment discharge) is an important factor for case managers in prevention strategy and a

major goal of this thesis. Appreciating that treatment providers can play an important role in warning clients at risk of premature treatment discharge and recognizing the potential impact of informing them of the degree of risk that they are facing, this author attempted to derive a simple heuristic for identifying relative risk and quantifying the degree of risk. This heuristic scoring scheme can then be provided to case treatment providers to enable improved outcomes and inform targeted intervention strategies.

As shown in Figure 5, the significant covariates from the Treatment model each have an associated standardized coefficients or beta coefficient. Per Equation (2), the coefficients (of the significant variables) permit a calculation of a range of theoretical predicted Treatment failure rates for every possible combination of significant covariate values. The theoretical failure rates give an idea of the degree of relative risk for every possible combination of covariate values. The calculations required in Equation (2), however, are not appropriate for a case manager nor are the resulting estimated probability of exiting the treatment program necessarily informative. Thus, a proxy scoring scheme that appropriately approximated the predicted probabilities was created.

The first attempted scoring scheme derived point values that were nearly equal to the beta coefficient values of the significant covariate terms. In the first iteration, 7 points were added if Mental Health = yes, 6 points were subtracted if Chronic Health = yes, and 5 points were subtracted if Prior Residence = Street or Treatment. In spite of the fact that the predicted probability is not a linear function of the coefficients, the scoring scheme has a very high degree of correlation (99.83%) to the predicted failure rates; see Figure 6.

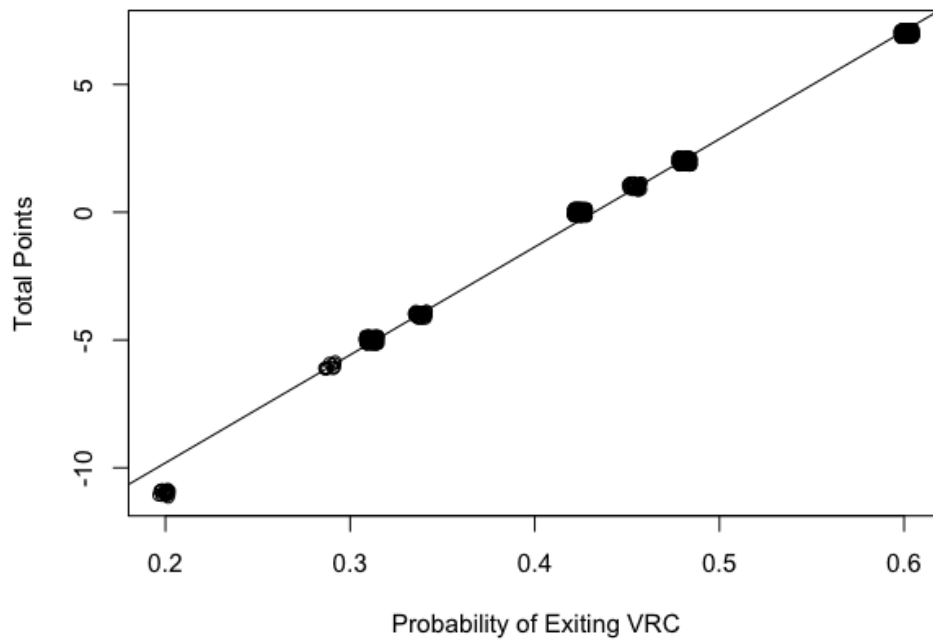


Figure 6. Initial Scoring Scheme vs. Exit Rate with 99.83% Correlation

Since the dichotomous experiments of a logistic regression model can only have one of two possible values for each experiment, a logistic regression produces a logistic curve (imperceptible in Figure 6). The logistic regression equation, however, can be written in terms of an odds ratio by taking the natural log of both sides. The log odds equation then is a linear function of the predictors and thus has a higher correlation (99.97%), with a linear point scheme assignment, as demonstrated in Figure 7.

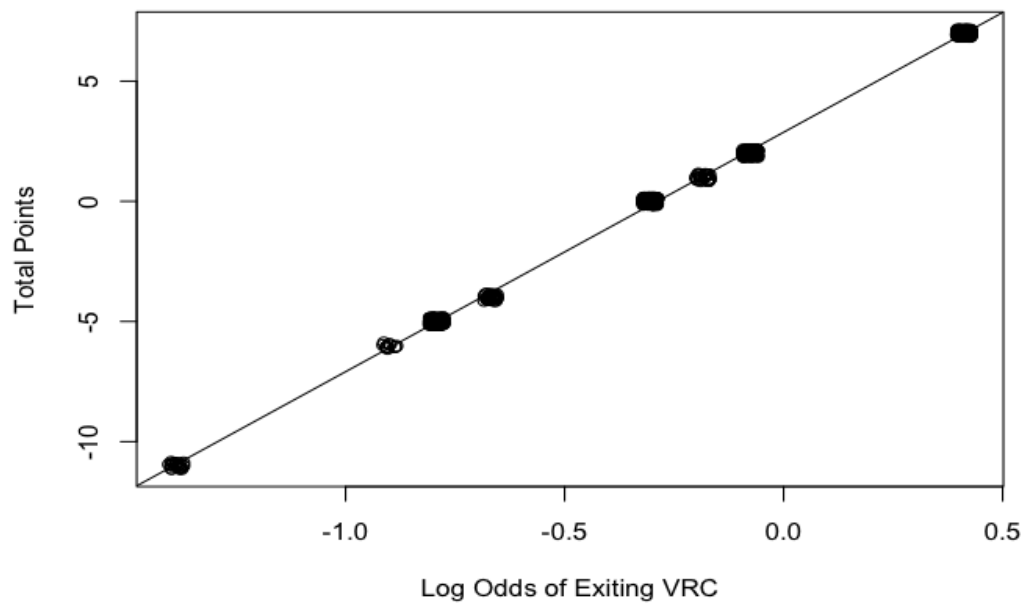


Figure 7. Initial Scoring Scheme vs. Log Odds of Exit Rate with 99.97% Correlation

Unfortunately, however, this scoring scheme is rather complicated. Thus, a simpler point scheme was derived (for ease of use by VVSD and other care providers) that preserves high correlation, but also preserves the ordering of the original scoring scheme. In the second iteration, 2 points were set as a baseline score from which 1 point was added if Mental Health = yes, 1 point was subtracted if Chronic Health = yes, and 1 point was subtracted if Prior Residence = Street or Treatment. This scoring scheme still has a very high degree of correlation (98.3%) and preserves the ordering. Table 1 demonstrates the relative ordering from the initial scoring scheme to the final scoring scheme. Figure 8 shows how the final scoring scheme correlates with the predicted probability of exiting the VRC treatment program. Comparing Figures 7 and 8, what is evident is that the final scoring scheme groups together those individuals with similar predicted probabilities of exiting the treatment program.

(a) Points	(b) Point Values and Counts			
	0	1	2	3
-11	22	0	0	0
-6	0	11	0	0
-5	0	158	0	0
-4	0	33	0	0
0	0	0	137	0
1	0	0	27	0
2	0	0	150	0
7	0	0	0	142

Table 1. Preservation of Relative Ordering from the Initial Scoring Scheme (a) to the Final Scoring Scheme (b)

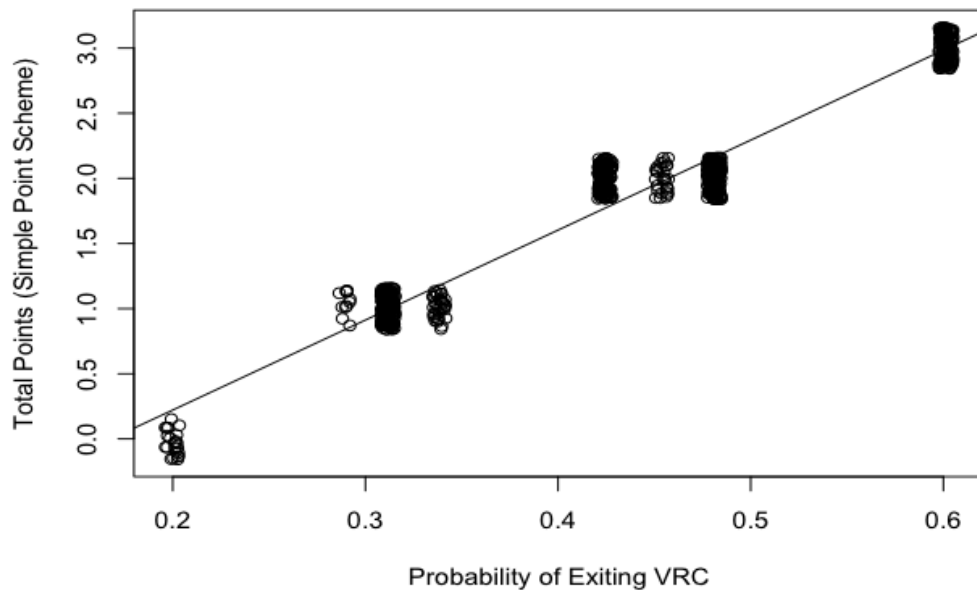


Figure 8. Final Scoring Scheme vs. Exit Rate with 98.3% Correlation

Given this simpler point scheme, the possible range of scores is: 0, 1, 2, or 3. These point values were then assigned to a range of failure rates and labeled with an exit risk category, as shown in Table 2.



Point Score	Exit Risk Range	Risk Level
0	0.2	Low
1	0.29 – 0.34	Average
2	0.42 – 0.48	High
3	0.60	Very High

Table 2. Final Scoring Scheme Risk Range and Level

### 1. Decision Support Tool

Finally, this risk ordering was used to derive the Service Member Attrition Risk Tool (S.M.A.R.T.) card, a decision support tool that was an originally conceptualized and created by this author (see Figure 9). It is the distillation of the work behind the Treatment model and captures the information discussed above. The S.M.A.R.T. card will enable leadership and case managers to identify clients who have the risk factors for higher likelihoods of premature Treatment exit. Equipped with the S.M.A.R.T. card, VVSD has a decision support tool to enable improved treatment outcomes, inform targeted interventions, and hopefully reduce treatment episodes for veterans by providing a better path to a sober, self-sustainable lifestyle.



## THE VRC **S.M.A.R.T.** CARD **SERVICE MEMBER ATTRITION RISK TOOL**

- |   |        |
|---|--------|
| 1. ALWAYS GIVE 2 PTS TO BEGIN                       | +2 PTS |
| 2. MENTAL HEALTH PROB = YES                         | +1 PT  |
| 3. CHRONIC HEALTH COND. = YES                       | -1 PT  |
| 4. PRIOR RESIDENCE = STREET<br>OR TREATMENT PROGRAM | -1 PT  |

### **RISK SCORE**

**0 LOW; 1 AVG; 2 HIGH; 3 VERY HIGH**

*“Dedicated to Leave No One Behind”*

Figure 9. VVSD Decision Support Tool

In discussing the simplicity of the VVSD S.M.A.R.T. card, it is important to highlight that the findings of this research actually identified three significant covariates that translate to six risk factors for early exit from the treatment portion (150 days) of the VRC program. The three risk covariates and six high-risk conditions that contribute to premature discharge are:

1. Mental health = Yes
2. Chronic health condition = No or Don't Know
3. Prior Residence = Jail or Temporary Housing or Don't Know

If a client self-reports with any of these conditions, his or her risk for early exit from the VRC is elevated. If multiple conditions are true, (across the categories from 1 to 3), the risks are compounded. It is important to note, however, that the options within chronic health condition and the options within Prior Residence are mutually exclusive. For example, a client cannot report that his Prior Residence is Jail and Temporary

Housing. Bearing this in mind, there are six unique combinations of client characteristics that equate to elevated discharge risk from the VRC.

In thinking about deriving a simple scoring scheme that assigns “points” (weighted for each factor’s significance) to each possible high-risk outcome, it initially made sense to formulate a rule that adds points to a running total. The highest point total summation would correspond to a client combination with the highest risk of premature exit. The author wanted to preserve the basic relationship that more points corresponded to higher risk.

With respect to computation, this scoring system, with multiple responses for high risk, is trivial, but the practical application becomes burdensome when the author considered deriving the simplest set of rules for the end user; in this case, the VRC case manager. When considering a significant covariate (Chronic Health Condition) that has more than one risk-factor response (No or Don’t Know), the employment of the rule set becomes more complicated for the practitioner. It is much easier for the end user to use a scoring scheme with the fewest number of rules that “add” points when one condition or another condition (but not both) are true, particularly when one of the possible responses is a “Don’t Know” response.

Fortunately, the scoring scheme becomes easier for the end user to employ when the covariates for the multi-option risk responses, and especially the responses with a Don’t Know option, are negated. The practical goal of negating covariates is to reduce the multi-option responses that require scoring and to eliminate the Don’t Know response. The mathematical effect of negation however, is that these new conditions correspond to a low-risk condition for early exit and should be subtracted from a running point total.

In this case, conditions (2) and (3) are negated for the reasons described above. When condition (2) is negated, only one (low-risk) response remains (Chronic Health = Yes), and when condition (3) is negated, the (Don’t Know) response is eliminated.

Note that the scoring scheme as derived in Figure 9 shows that each scoring process begins with a +2. The +2 starting point corresponds to an individual with the following characteristics:

- (a) Mental health = No

- (b) Chronic health condition = No or Don't Know
- (c) Prior residence = Jail or Temporary housing or Don't Know

This combination of characteristics translates to a client with a fairly high chance of leaving (2 points = exit probability of 0.42 to 0.48) and establishes the “baseline” person. It is from this “baseline” that an end user can easily subtract low-risk factors and arrive at a final score that corresponds to an analytically calculated probability of exit with 98.3% correlation. Equipped with the S.M.A.R.T. card, VVSD has a decision support tool to identify risk factors in VRC clients that will enable improved treatment outcomes through targeted interventions.

#### **D. GRADUATION MODEL**

As discussed above, the Gradation model is unique from the Treatment model in that Length of Stay is the most critical covariate. As the literature suggests, as Length of Stay increases, Graduation exit rates decrease. Length of Stay, however, is not the only significant covariate. As noted earlier, the Prior Residence variables also contribute to reducing exit risk. Specifically, if a client reports that their most immediate residence prior to admission to the VRC is jail or some other detention facility, he or she has a significantly lowered risk of exit from the VRC program.

Figure 10 shows that the probability of program exit decreases as Length of Stay increases for every Prior Residence variable. Compared to all probability of exit curves, a Prior Residence of Temporary Housing is associated with the highest probability of program exit and a Prior Residence of Jail/incarceration is associated with the lowest probability of program exit. Additionally, as Length of Stay increases the differences among the probability of exit curves due to Prior Residence are reduced. In other words, Prior Residence has a larger effect on probability of exit for short length of stay periods and a smaller effect on probability of exit for longer length of stay periods.

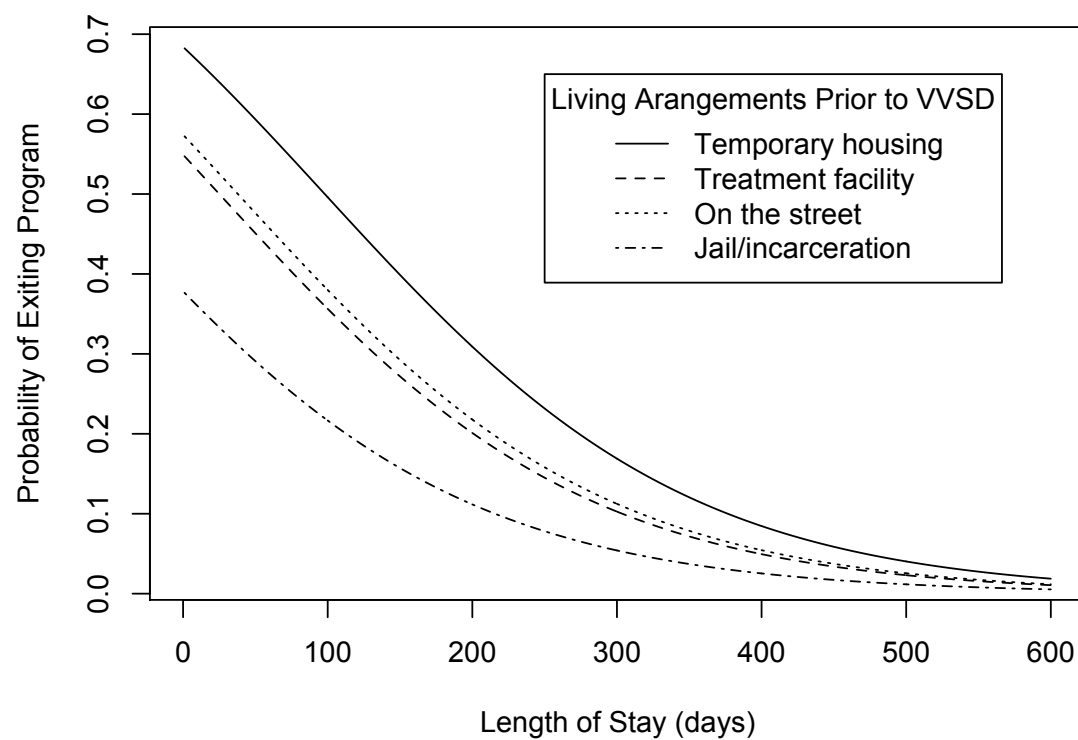


Figure 10. Graduation Model Predicted Probability of Exiting the Program

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## **V. DISCUSSION**

### **A. OVERVIEW**

This thesis research filled a gap in the literature on predictors of retention in a treatment program for homeless veterans and can help inform the greater problem of reducing veteran homelessness. The data are based on a cohort of homeless veterans in treatment at the VRC at VVSD, a unique program that has served homeless veterans since 1981. This thesis assessed the value of a specific set of client variables in predicting treatment phase retention and overall program completion of a treatment program for homeless veterans. In doing so, this thesis has added to the body of knowledge about what affects success in an intervention program, specifically a program designed to help homeless veterans become self-sustaining and independent.

Additionally, this thesis has defined a decision support methodology that can be used by veteran homeless service providers to make improved decisions about intervention strategies for high-risk clients and thereby maximize program effectiveness and efficiency. Managers at all levels must make resource allocation decisions that involve uncertainty and risk. They often must make these decisions with a limited timeframe and with incomplete information. The simple scoring-scheme heuristic defined in this thesis will allow treatment providers to expeditiously identify clients whose risk of premature discharge is high. Furthermore, the VRC S.M.A.R.T. card can easily be used by the VVSD leadership and VRC case providers to identify high-risk veterans and inform strategies for targeted interventions.

In summary, the unique contributions of this body of work are (1) the employment of logistic regression analysis to provide a computational method for highlighting the major risk factors of a population of homeless veterans, and (2) the creation of the VRC S.M.A.R.T. card that transforms the logistic regression results into actionable knowledge and can enable the development of intervention strategies based on evidence-based solutions. Combined with expert opinion and case manager experience, the VRC S.M.A.R.T. card can become a critical decision support tool to help high-risk veterans remain engaged in treatment, attain treatment goals, graduate, and fully prepare them to reintegrate into a sober, self-sustaining lifestyle.

Ultimately, information regarding a client's mental health, chronic health, and information regarding the client's most immediate prior residence before admission to the VRC proved to be significant independent predictors of premature discharge from treatment. Similarly, length of stay in treatment and information regarding the client's immediate prior residence before admission to the VRC proved to be significant independent predictors for program completion and graduation. Note that these models are not intended to predict an individual's probability of success; rather their utility lies in their ability to identify the major risk factors of premature discharge among a population of veterans. Understanding and correctly interpreting risk factors is a major finding of this work and informs the development of prevention strategies, based on evidence-based solutions.

## **B. IDENTIFIED RISK FACTORS**

Overall, 384 of 680 (56%) of clients remained in treatment at least 150 days to complete the official Treatment portion of the VRC program. Only 290 of 680 (42.6%) of clients successfully completed the entire VRC program. Program completion success conditioned on Treatment success, however, was considerably improved. Of the clients who did complete the Treatment portion of the VRC program, 266 of 384 (69%) went on to graduate and complete the overall VRC program. These findings are consistent with the literature as discussed in Chapter II.

In this thesis, indicators for the presence of a mental health condition among clients proved to be a risk factor for premature treatment exit. Clients who reported that they had a Mental Health problem had a 48% success rate at the 150-day mark of VRC treatment as opposed to those that reported no mental health problem (65% success) or those that didn't know (68% success). These findings are also consistent with the literature as discussed in Chapter II.

Conversely, a positive chronic health condition contributed to Treatment success. Clients who reported they had a Chronic Health Condition had a 67% success rate at the 150-day mark of VRC treatment as opposed to those that reported no chronic health condition (55% success) or those that didn't know (50% success).



Additionally, clients who reported that their residence immediately prior to gaining admission to the VRC was from the Streets or a place not meant for human habitation had a 61.7% success rate for Treatment. Clients who reported that their prior residence was a treatment facility that included a hospital (psychological or physical condition), substance abuse treatment facility or detoxification center 62% success rate for Treatment. Conversely, success rates were considerably lower for clients whose prior residence was Jail (53%), Transitional Housing (52%), Unknown (46%).

### **C. FROM DATA TO ACTIONABLE INFORMATION**

HUD manages the HMIS and collects large amounts of data. With more data comes the risk of a widening gap between data collection and data comprehension. It is often difficult to process all the data and make rational decisions of basic trends. The models developed in this thesis research will facilitate the creation of knowledge to support homeless and substance abuse treatment providers in making intelligent decisions to improve program outcomes.

Understanding the major risk factors of premature treatment discharge is an important contribution of this body of work and can inform future attrition prevention strategies. Treatment providers at VVSD can now play an important role in warning clients whose premature treatment discharge risk is high. They can also quantify the degree of risk that a client is facing. Consider the example of a typical 46-year-old homeless veteran who is unaware of Prior Residence risk factors, but wants to know the risk of his or her history of mental health condition on the likelihood of succeeding in treatment. Explaining the relative risk of his/her mental health status, given the presence of other risk factors and interpreted with the aid of the VRC S.M.A.R.T. card, will make the situation clearer. These models should not be used to predict an individual's probability of success or failure in a treatment program, but rather, they can assist in interpreting and understanding the risk factors of early exit from treatment.

In much of the same way as understanding that smoking is an epidemiological risk factor for lung disease, expressing and interpreting risk factors of early treatment discharges provides vital information for future treatment plans and intervention strategies. This thesis used logistic regression analysis on a given set of client variables to

provide a computational method for highlighting the major risk factors of a population of veterans. The purpose was to transform existing information into useful and actionable knowledge that, together with expert opinion, is helpful for improved program efficiency and effectiveness.

To the extent that fixed patient-level variables such as mental illness, chronic health condition, and immediate previous residence contribute to premature discharge from treatment in the VRC program and programs like it, it may be necessary to adjust treatment plans and programs around these variables. In fact, VVSD can use the work of this research to develop screening measures so that patients can be efficiently identified and targeted by staff early in the course of treatment. VVSD would be prepared to develop individualized treatment plans with high-risk veterans, a strategy that has been cited in the treatment literature to reduce attrition (Miller, 1985). Furthermore, as with any optimization model, VVSD now has intelligent information to inform resource allocation schemes in the event that additional resources become available. These resources could take the form of increased staff, extra case manager hours, or increased treatment intensity and attentiveness.

#### **D. STUDY LIMITATIONS**

It is important to highlight several important limitations of this thesis research. First, this thesis relied heavily on self-reported data, and information regarding treatment history is vulnerable to misreporting. Upon careful reflection, however, the possibility of misinformation or disinformation from self-reporting was not an issue for this research. Self-reported responses were analyzed at face value. The unique approach of this thesis is the ability to provide a risk assessment from a self-reported characteristic, regardless of whether or not that characteristic is factually accurate. The ability to customize treatment plans can be based on how a client identifies themselves with respect to client characteristics.

Finally, retention appears to be best predicted by more dynamic (i.e., changeable) client characteristics, such as motivation and program participation (De Weert-Van Oene, Schippers, De Jong, & Schrijvers, 2001), as opposed to unchangeable characteristics, such as substance abuse. This finding suggests that treatment success is likely a matter of

determining ways to influence clients' perceptions and experiences, as opposed to struggling against fixed characteristics that are difficult or impossible to change.

Future research would benefit from examining the impact of measures of treatment engagement on retention. Qualitative research may also help to elucidate the "purpose" of clients' stays in the VRC and the impact this may have on their intent to remain in treatment. For example, did some clients come to the VRC with the intent of staying only a brief period of time while transitioning from one living quarters to another, while others were intent on seeking more intensive services and planned to stay much longer? This type of inquiry might help to identify those clients whose length of stay might be expected to be short.

### **1. Study Limitation: Lack of Treatment Information**

An important limitation in this thesis research is the lack of treatment information. These "process variables" as Drymalski (2009) refers to them are the during-treatment or in-treatment variables that likely have an impact on attrition. Pretreatment variables (all of the variables in this study) only account for a portion of the explanation for attrition. As Rowan-Szal, Joe, and Simpson, (2000) write, "Treatment process components are relatively more important than patient demographic and background variables since their inclusion in the model made only marginal improvements" (p. 57). Unfortunately, no process variables were included in this study, because they were unavailable. This study was retrospective and was conducted with preexisting data that did not include process variables. The lack of process variables will unfortunately restrict the predictive power of the models.

### **2. Recommendations for Future Research: Obtain, Analyze, and Include Treatment Information in the Models**

Future research findings would likely improve if process variables were regularly and readily available to analyze. For example, the models might have better predictive power if the HMIS intake battery was administered to every client at periodic intervals during their stay at the VRC. Unfortunately, this assessment battery is only administered once within the first week or two of admission. Yet, the battery was also intended to be administered at the end of treatment, but many clients left without exit interviews.

Systematic and repeated administration of the assessment battery, at regular time-stepped intervals, would help address some of the shortcomings caused by a lack of process variables. In addition, information about the actual treatment regime for each client would likely improve model predictive power. If so, then it is conceivable that additional scoring schemes could be developed that would update a client's risk of exiting the program.

### **3. Study Limitation: Lack of Outcome and Follow-Up Assessment**

No end-of-treatment or follow-up assessments were conducted after a client was discharged from the VRC. The absence of follow-up assessments precluded any analysis on the effectiveness of the treatment or how perceptions of treatment changed over time. Even 30- or 60-day follow-up assessments would have the potential to increase the predictive power of the models, particularly in the VRC when some clients achieved program success after multiple episodes of homelessness. Follow-up data would help to determine if what in-process variables were actually beneficial for retention and what impact a targeted intervention (as a result of the S.M.A.R.T. card) might have had on retention and long-term prognosis.

### **4. Recommendations for Future Research: If Possible, Conduct Outcome and Follow-Up Assessments and Incorporate the Information into the Models**

Follow-up assessments are extremely valuable to fully assess treatment retention, but it is very hard to obtain. Even VVSD clients who left the VRC to live in transitional housing do not yet have a stable address. The clients who voluntarily left the VRC and returned to the streets are even harder to reach. Very few clients have mobile communication devices. Drymalski (2009) offers that the principle of providing some type of incentive to encourage discharged clients to return for follow-up assessments may be useful to reach these departing clients.

## **E. CONCLUSIONS**

Despite the shortcomings and limitations, it is hoped that this thesis research can provide a unique contribution to the research in treatment retention among homeless

veterans and help to bring additional light to the veteran homelessness problem in general. With additional research in the areas described above, this author believes there is promise in understanding better ways to identify clients at greatest risk of early exit from treatment, predict treatment retention and program completion, and help veterans remain in treatment.

It is hoped that this body of work can inform and guide future research on targeted intervention strategies to maximize program effectiveness and efficiency. The overall goal is for veterans to remain engaged in treatment, attain treatment goals, graduate, and become fully prepared to reintegrate into a sober, self-sustaining lifestyle, with opportunities for employment and a secure place to live. Our veterans deserve nothing less.

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## **APPENDIX A. DEFINITION OF “HOMELESS VETERAN”**

Individuals must meet the definition of “homeless veteran” in order to qualify for assistance under the many federal homeless veteran programs. The term “homeless veteran” has two parts to the definition. First, the definition of “veteran,” for purposes of Title 38 benefits, is a person who served in the active military, naval, or air service and was not dishonorably discharged. Second, veterans are considered homeless if they meet the definition of “homeless individual” codified as part of the McKinney-Vento Homeless Assistance Act.

A complete discussion and extensive review of the legal definition of a homeless veteran is provided in (Perl, 2012) in which she provides the United States Code definition of “a veteran who is homeless” as stipulated in the McKinney-Vento Homeless Assistance Act:

(1) an individual who lacks a fixed, regular, and adequate nighttime residence, and (2) a person who has a nighttime residence that is: a supervised publicly or privately operated shelter designed to provide temporary living accommodations (including welfare hotels, congregate shelters, and transitional housing for the mentally ill); an institution that provides a temporary residence for individuals intended to be institutionalized; or a public or private place not designed for, nor ordinarily used as, a regular sleeping accommodation for human beings.

Legislation was enacted in the 111th Congress, however, that expanded the definition of “homeless individual” and included categories to the way in which a person might experience homelessness. The new statute moved away from a previous requirement of literal homelessness. A third change made to the definition of homeless individual included those individuals who are fleeing a situation of domestic violence or some other life-threatening situation (Perl, 2012).

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## **APPENDIX B. ESTIMATES OF THE NUMBER OF HOMELESS VETERANS**

The exact number of homeless veterans is unknown, although methods used to estimate their numbers have been improving in recent years. Up until 2011, both the VA and HUD conducted separate assessments of the number of homeless veterans over a period of years. Beginning in 2011, however, the two agencies began to coordinate efforts and use one count as the definitive estimate of veteran homelessness (HUD, 2011).

Before 2009, HUD had released four AHARs that included the percentage of veterans who were homeless, not the number. The 2009 and 2010 supplements, however, provided estimates about veterans experiencing homelessness. In addition, HUD released the 2011 point-in-time results on December 13, 2011, which include an estimate of homeless veterans. That supplement estimated that 76,329 veterans experienced homelessness on one night in January 2010. HMIS researchers estimated that 144,842 veterans were homeless on at least one night from October 1, 2009 through September 30, 2010.

In both the point-in-time estimate and the HMIS estimate, veterans were overrepresented in the homeless population. According to the point-in-time estimate, veterans represented 16% of the adult homeless population (compared to 9.5% of the total adult population), and in the HMIS estimate veterans were about 13% of the adult homeless population (Perl, 2012).

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## **APPENDIX C. FEDERAL PROGRAMS THAT SERVE HOMELESS VETERANS**

The federal response to the needs of homeless veterans began in the late 1980s. Congress became aware of the data showing that veterans were disproportionately represented among homeless persons. Among the programs enacted were Health Care for Homeless Veterans, Domiciliary Care for Homeless Veterans, and the Homeless Veterans Reintegration Program. In 1990, the first national group dedicated to the cause of homeless veterans, the National Coalition for Homeless Veterans (NCHV) was established. A complete discussion and extensive review of the various federal programs that serve homeless veterans is provided in (Perl, 2012). Brief summaries are below.

### **A. THE DEPARTMENT OF VETERANS AFFAIRS**

As mentioned above, the majority of programs that serve homeless veterans are part of the VHA, one of the three major organizations within the VA. The VHA operates hospitals and outpatient clinics across the country through 21 Veterans Integrated Service Networks (VISNs) and they place Homeless Veteran Outreach Coordinators (HVOCs) in its offices in order to assist homeless veterans in their applications for benefits.

### **B. HEALTH CARE FOR HOMELESS VETERANS**

Health Care for Homeless Veterans (HCHV) was the first federal program to specifically address the needs of homeless veterans. In the HCHV program, VA medical center staff perform outreach operations to homeless veterans; provide care and treatment for medical, psychiatric, and substance use disorders; and refer veterans to other needed supportive services.

### **C. DOMICILIARY CARE FOR HOMELESS VETERANS**

Domiciliary care consists of rehabilitative services for physically and mentally ill or aged veterans who need assistance, but are not in need of the level of care offered by hospitals and nursing homes. The program was designed to reduce the use of more expensive inpatient treatment, improve health status, and reduce the likelihood of homelessness through employment and other assistance.

#### **D. COMPENSATED WORK THERAPY (CWT) PROGRAM**

The Compensated Work Therapy (CWT) program has existed at the VA in some form since the 1930s. The CWT program is permanently authorized through the VA's Special Therapeutic and Rehabilitation Activities Fund. The CWT is designed to provide disabled veterans work experience and skills so that they may reenter the workforce and maintain employment on their own. The VA employs veterans directly, finds employment for veterans at other federal agencies, or enters into contracts with private companies or nonprofit organizations that then provide veterans with work opportunities.

#### **E. GRANT AND PER DIEM PROGRAM**

Initially titled the Comprehensive Service Programs, the Grant and Per Diem program was introduced as a pilot program in 1992, through the Homeless Veterans Comprehensive Services Act. The law establishing the Grant and Per Diem program authorizes the VA to make grants to public entities or private nonprofit organizations, like VVSD, to provide services and transitional housing to homeless veterans.

#### **F. GRANT AND PER DIEM FOR HOMELESS VETERANS WITH SPECIAL NEEDS**

In 2001, Congress created a demonstration program to target grant and per diem funds to specific groups of veterans. These groups include women, women with children, the elderly, veterans with terminal illnesses, and veterans with chronic mental illnesses. A new law called the Veterans' Mental Health and Other Care Improvements Act of 2008 (P.L. 110-387) authorized a program of supportive services to assist very low-income veterans and their families, who either are making the transition from homelessness to housing or who are moving from one location to another.

#### **G. ENHANCED USE LEASES**

Since 1991, the VA has had the authority to enter into leases with homeless service providers to use VA property for a period of time. The arrangement, called Enhanced-Use Leases (EULs), was made possible as part of the Veterans' Benefits Programs Improvement Act (P.L. 102-86). In general, the VA may enter into a lease that

advances the mission of the VA and enhances the use of the property or would improve services to veterans in the local area.

#### **H. ACQUIRED PROPERTY SALES FOR HOMELESS VETERANS**

The Acquired Property Sales for Homeless Veterans program is operated through the VBA. The program was enacted as part of the Veterans Home Loan Guarantee and Property Rehabilitation Act of 1987 (P.L. 100-198). Through this program, the VA is able to dispose of properties that it has acquired through foreclosures on its loans so that they can be used for the benefit of homeless veterans.

#### **I. VA AND HUD COLLABORATIONS – HUD-VASH**

The HUD-VASH program began in 1992, as a collaborative effort between the VA and HUD where HUD provided housing to homeless veterans through a set-aside of Section 8 vouchers and the VA provided supportive services. The program targeted veterans with severe psychiatric or substance use disorders. Through the program, local PHAs administered the Section 8 vouchers, while local VA medical centers provided case management and clinical services to participating veterans.

#### **J. PROJECT-BASED HUD-VASH VOUCHERS**

HUD allows PHAs to project-base their HUD-VASH vouchers. When vouchers are project-based, they are attached to a specific unit of housing and do not move when the tenant moves. This may be desirable in housing markets where it is difficult to find housing providers who accept vouchers, and it may be a more efficient arrangement for providing supportive services.

#### **K. DEMONSTRATION PROGRAM TO PREVENT HOMELESSNESS AMONG VETERANS**

As part of the FY2009 Omnibus Appropriations Act (P.L. 111-8), Congress appropriated \$10 million through the HUD Homeless Assistance Grants account to be used for a pilot program to prevent homelessness among veterans. The appropriation law required that the program be operated in a limited number of sites, at least three of which

were to have a large number of individuals transitioning from military to civilian life, and at least four of which were to be in rural areas.

#### **L. THE DEPARTMENT OF LABOR (DOL)**

The DOL contains an office specifically dedicated to the employment needs of veterans, called the office of Veterans Employment and Training Service (VETS). In addition to its program for homeless veterans—the Homeless Veterans Reintegration Program (HVRP)—VETS funds employment training programs for all veterans. These include the Veterans Workforce Investment Program and the Transition Assistance Program.

#### **M. HOMELESS VETERANS REINTEGRATION PROGRAM**

Established in 1987 as part of the McKinney-Vento Homeless Assistance Act (P.L. 100-77), the HVRP was authorized most recently through FY2012, as part of the Veterans Health Care Facilities Capital Improvement Act of 2011 (P.L. 112-37). In 2010, the Veterans' Benefits Act of 2010 (P.L. 111-275) created a separate HVRP for women veterans and veterans with children. The HVRP program has two objectives. The first is to assist veterans in achieving meaningful employment, and the second is to assist in the development of a service delivery system to address the problems facing homeless veterans.

#### **N. INCARCERATED VETERANS TRANSITION PROGRAM**

The Homeless Veterans Comprehensive Assistance Act of 2001 (P.L. 107-95) instituted a demonstration program to provide job training and placement services to veterans leaving prison. The program expired on January 24, 2006, but was extended by Congress through FY2012 as part of the Veterans' Mental Health and Other Care Improvements Act of 2008 (P.L. 110-387).

## **APPENDIX D. THE VA PLAN TO END VETERAN HOMELESSNESS**

We will provide new help for homeless Veterans because those heroes have a home—it's the country they served, the United States of America. And until we reach a day when not a single Veteran sleeps on our nation's streets, our work remains unfinished.

—President Barack Obama, March 16, 2009

It is simply unacceptable for individuals, children, families and our nation's Veterans to be faced with homelessness.

—President Barack Obama, June 18, 2009

On November 3, 2009, the VA announced a plan to end homelessness among veterans within five years (U.S. Department of Veterans Affairs, 2009.) The VA outlined six areas of focus for the new plan: (1) outreach and education, (2) treatment, (3) prevention, (4) housing and supportive services, (5) employment and benefits, and (6) community partnerships. In both the FY2011 and FY2012 budget documents, the VA laid out program expansions and implementation of new programs to address homelessness.

In FY2012, the VA planned to expand some of the existing homeless programs discussed in Appendix C. Specifically, the Grant and Per Diem program would serve 20,000 veterans (in FY2008, the program served 15,511 veterans), the Domiciliary Care for Homeless Veterans program planned to open five new 40-bed facilities in FY2012, and the HUD-VASH program received additional vouchers.

The VA-HUD pilot program to prevent veteran homelessness and the VA program of supportive services for very low-income veteran families have both become operational, with grants awarded to service providers. The VA expects to serve 1,900 veterans between 2011 and 2014 in the prevention pilot, and 19,000 veterans in the Supportive Services for Veterans Families (SSVF) program. The VA established a National Homeless Registry to keep records of veterans served in homeless-specific programs and measure the outcomes. The VA also established a National Call Center for homeless veterans and expects to serve 15,500 veterans in 2012 (Perl, 2012).

HUD Secretary Shaun Donovan, Health and Human Services (HHS) Secretary Kathleen Sebelius, VA Secretary Eric K. Shinseki, and Labor Secretary Hilda Solis share the belief that no one should experience homelessness, no one should be without a safe, stable place to call home (U.S. Department of Veterans Affairs, 2009).



## **APPENDIX E. FUTURE OF VETERAN HOMELESSNESS**

Over the last several years, estimates of homeless veterans have declined. The VA estimates of the number of veterans who were homeless on a given day fell from 154,000 in FY2007 to 131,000 in FY2008, and then to 107,000 in FY2009. The Veterans Supplement to HUD's Annual Homeless Assessment Report estimated that in 2011 the number had fallen to about 67,000, a nearly 9,000-person reduction from the previous year's estimate. This 12% decline keeps the Obama administration on track to meet the goal of ending veteran homelessness in 2015 (U.S. Department of Housing and Urban Development and U.S. Department of Veterans Affairs, 2011).

We have been successful in achieving this milestone due to strong leadership from the President and hard work by countless community organizations and our federal, state, and local partners who are committed to helping Veterans and their families get back on their feet . . . . This new report is good news for the tens of thousands of Veterans we have helped find a home. Our progress in the fight against homelessness has been significant, but our work is not complete until no Veteran has to sleep on the streets.

—Secretary of Veterans Affairs Eric K. Shinseki (U.S. Department of Veterans Affairs, 2011, p. 1)

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## **APPENDIX F. VETERANS VILLAGE OF SAN DIEGO**

VVSD has provided comprehensive employment, treatment, and housing services for disenfranchised, unemployed and homeless veterans since 1984. The VVSD Mission Statement is simple: VVSD is dedicated to “Leave No One Behind.” For the past 30 years, VVSD has focused on helping homeless veterans overcome addiction, homelessness, PTSD, TBI, long-term unemployment, and major depression. They provide over 350 year-round veteran beds in San Diego County, including a 185-bed Licensed Drug Treatment Facility two miles north of downtown San Diego. In the past several years, VVSD placed over 300 unemployed veterans into long-term jobs, with an average starting wage exceeding \$13 per hour. This helps explain why San Diego Mayor Jerry Sanders stated, “We get more bang for our buck out of Veterans Village than anything else we do, bar none” (see [www.vvsd.net](http://www.vvsd.net)).

VVSD does not have a specific business philosophy. Instead, they focus on helping veterans achieve specific benchmarks. These benchmarks are: (1) a veteran no longer living on the street, (2) long-term sobriety, (3) stable income either from employment or from disability benefits when the disability precludes employment, (4) good long-term medical health, and (5) mental health stability.

VVSD employs over 100 full-time employees, with an operating budget that exceeds \$8 million. In 2007 and again in 2008, Vietnam Veterans of San Diego hosted two different VA Secretaries, Jim Nicholson and Dr. James Peake. These former Secretaries praised VVSD’s Stand Down program and commended them for over 20 years of excellent transitional housing programs. In his speech, Secretary Nicholson stated, “VVSD is a model for community-based social services for homeless veterans.” He went on to say that “VVSD sets the bar” for community organizations and further described VVSD as “the gold standard of transitional housing for homeless veterans.” VA Homeless Director Pete Dougherty stated “There is no finer program for homeless veterans in America than VVSD” (see [www.vvsd.net](http://www.vvsd.net)). Despite these accolades, VVSD measures employment programs with a basic bottom-line goal of placing at least 165 veterans who have significant employment barriers (addiction, mental illness, lack of work skills, etc.) into long-term jobs over a three-year period.

VVSD is perhaps best known as the agency that developed the homeless veteran Stand Down in 1988. Operating for over 25 years, VVSD Stand Down has been replicated in over 200 cities across the United States, including Washington, D.C., Philadelphia, and Milwaukee. In 2010, over 900 homeless veterans participated in VVSD's San Diego Stand Down and the CBS program *60 Minutes* produced a 12-minute news feature on the VVSD Stand Down, which can be found at <http://www.cbsnews.com/video/watch/?id=7372852n>.

Stand Down has been strongly endorsed by the last three California governors and by several U.S. Presidents. VVSD receives hundreds of client referrals annually from the VA, DOL, and County Alcohol and Drug Services. They work closely with the local Transition Assistance Program (TAP) to help veterans separating from the military.

VVSD maintains important relationships with hundreds of nonprofit, government, for-profit and individuals who support their mission of helping improve the lives of homeless veterans. Major business supporters include Denny's Restaurants, Western Truck Driving School, and Home Depot, while major nonprofit partners include Catholic Charities and Father Joe's Villages, The San Diego Workforce Partnership, and the Salvation Army. VVSD's major government funders include the VA, DOL, HUD, San Diego County Alcohol and Drug Services, the San Diego County Veteran Service Office, and the California Employment Development Department (see [www.vvsd.net](http://www.vvsd.net)).

Over 28,000 San Diego County veterans have served in the current campaigns in Iraq and Afghanistan, far more than any U.S. region and nearly twice the number as number two, Los Angeles. Partly due to this influx, VVSD has more than doubled the number of Iraq/Afghan veterans they serve. One major program, known as Warrior Traditions, exclusively serves Iraq/Afghan veterans and their families. In 2010, VVSD's Warrior Traditions served approximately 1,200 Iraq/Afghan veterans and 300 family members. In total, VVSD served over 2,500 veterans and over 500 family members in 2010.

Overall, VVSD sets a standard for homeless veteran treatment and intervention. Focused on homeless veterans since 1981, it is no surprise that VVSD is recognized for its exceptional commitment to helping homeless veterans. In 2002, the local ABC

television station selected VVSD as the San Diego Nonprofit of the Year. In 2005, the San Diego County Bar Association selected VVSD as their “Distinguished Nonprofit of the Year” (see [www.vvsd.net](http://www.vvsd.net)).

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## **APPENDIX G. THE VETERANS VILLAGE OF SAN DIEGO (VVSD) VETERAN REHABILITATION CENTER (VRC) PROGRAM**

VVSD's Treatment model is based on the time-tested Minnesota model, which combines 12-Step recovery principles with education, group counseling, individual counseling, therapy, job training, and referral. The VVSD VRC program is divided into four phases.

The first 30 days of the VRC is called the Assessment phase. Clients are evaluated and observed to determine precise program needs. This preliminary phase provides an opportunity for clients to complete outside appointments and organize their other affairs in order to prepare themselves for Phase 1 treatment.

During Phase 1, clients arrive at VVSD after a period of detoxification. They become part of a community of approximately 165 other veterans, each working toward recovery from alcoholism and/or chemical addiction. This phase lasts between 90 and 120 days (up to 150 days) and clients are required to make themselves available for classes and group meetings from 7:00 am to 4:00 pm, Monday through Friday. Classes include course work in Alcohol and Drug Education, Anger Management, Healthy Relationships, Family Dynamics, Personal Boundaries, Journaling, Changing Criminal Behavior, and a 12-Step Education sequence in both Alcoholics Anonymous and Narcotics Anonymous. Each client meets with his or her assigned Counseling Process Group (Home Group) at least weekly. Clients are also assigned individual case managers and are required to attend weekly meetings to discuss treatment progress and challenges. Clients are assessed for therapy improvement within the first month of Phase 1.

VVSD VRC clients are expected to attend 12-Step meetings in the evenings, with a goal of attending 90 meetings in 90 days. Additionally, clients are expected to find a 12-Step sponsor and work through Steps 1–3 prior to transitioning to the next phase. Toward the end of Phase 1, clients enroll in Job Club, where clients learn job preparation skills and prepare for employment opportunities during Phase 2.

When the case manager deems that his or her client is ready for an employment assessment and has adequately completed the more formal treatment sequence in Phase 1, clients advance to Phase 2. Transition to Phase 2 is celebrated at a House Meeting, where

successful clients receive a certificate and share his or her testimonial with fellow residents. In Phase 2, clients acquire job search and job application skills. Clients complete a comprehensive employment course that includes resume-writing skills, interviewing skills, work ethic, and job placement assistance. Clients are expected to attend several weekly meetings that include a Home Group meeting, a Relapse Prevention class, 3–5 AA or NA meetings, a Case Management session, and one House Meeting. Clients continue to work with a 12-Step sponsor, and work toward completing all 12 Steps. Several clients continue to meet with a mental health therapist. While in Job Club, some clients enroll in training schools or apprenticeship programs that are funded through the VVSD Employment Department, while the rest continue to look for employment opportunities with their employment counselor. Clients who have disabilities focus on establishing benefits and receiving treatment for their disabilities. Some clients explore volunteer opportunities, and others are referred to the Wellness and Vocational Enrichment (WAVE) program at the VA Medical Center in San Diego. The WAVE is an employment readiness program that seeks to assist disabled veterans in reentering the workforce.

After securing employment, clients are ready to transition to Phase 3. The meeting attendance expectations remain the same as Phase 2. During Phase 3 clients are required to commit 30% of their income toward the cost of rent, up to a maximum of \$300. Clients continue to work with their sponsors in 12-Step recovery and make final preparations for full reintegration into society. Clients prepare for the challenges of staying sober, remaining mentally and physically stable, and living independently after graduation from VVSD. Phase 3 topics include personal budgeting, staying employed, and the importance of remaining connected with VVSD's alumni network. Phase 3 is critical to a successful transition from homelessness, substance abuse and dependency to self-sufficiency.



## **APPENDIX H. CONTINUUM OF CARE (COC) AND HOUSING FIRST MODELS**

Typically, the CoC model employs emergency homeless shelters as an initial entry point for service. These shelters provide homeless and unsheltered individuals and/or families a place of refuge from the outdoor elements (Burt et al., 2002).

The CoC perspective presumes that individuals have deficits that need to be mitigated before they can achieve economic mobility and self-sufficiency. After a period of stabilization, researchers believe that individuals are better prepared to enter a transitional program, where treatment can commence and clients can attain critical skills, prior to placement in a permanent housing environment (Hoch & Bowden, 1998).

A relatively new paradigm called the “Housing First” model challenges the CoC model. Proponents of this theory argue that all persons—whether they suffer from serious mental illness, substance abuse, or other medical or social conditions are not, “ready” for housing and can be successfully maintained in permanent housing with little programmatic structure or requirements (Tsembiris et al., 2004). Housing First reasons that there is no need for emergency or transitional shelters and homeless clients should be moved immediately into permanent housing. The landmark New York City supportive housing study provided empirical evidence that Permanent Supportive Housing can be effective and cost-efficient, compared to the use of emergency shelters and other emergency services for chronically homeless, mentally-ill clients (Culhane, Metraux, & Hadley, 2001).

Although the VRC program for homeless veterans at VVSD subscribes to the CoC model where participation is voluntary, the program does have compliance guidelines where disenrollment is justified for clients who relapse or fail to attend required meetings. The pseudo-military environment has proven to be effective for the homeless veteran population at VVSD.

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## **APPENDIX I. HMIS REPORT VARIABLE DEFINITIONS**

Abridged from the Homeless Management Information System (HMIS)

Data Standards, U.S. Department of Housing and Urban Development

Office of Community Planning and Development

March 2010

The data elements within the HMIS Standards Document provide the baseline data collection requirements for all CoC programs. Unless annotated otherwise, the Universal Data elements discussed below provide the inputs for the models of the current thesis research.

- 3.1 Name (Not available in this thesis)
- 3.2 Social Security Number (Not available in this thesis research)
- 3.3 Date of Birth (Not available in this thesis research)
- 3.4 Race
- 3.5 Ethnicity
- 3.6 Gender
- 3.7 Veteran Status
- 3.8 Disabling Condition
- 3.9 Residence Prior to Program Entry
- 3.10 Zip Code of Last Permanent Address
- 3.11 Housing Status (Not available in this thesis research)
- 3.12 Program Entry Date
- 3.13 Program Exit Date
- 3.14 Unique Person Identification Number (Not available in this thesis research)
- 3.15 Household Identification Number (Not available in this thesis research)

Data elements 3.1 through 3.11 require that staff from a CoC Program enter information provided by a client into the HMIS database. Data elements 3.1 to 3.6 only need to be collected the first time an individual uses a particular CoC Program or, where HMIS data are shared among providers in a CoC, the first time an individual uses a

program offered by any provider in that community. If some of this information is not collected the first time a client accesses services or is later found to be inaccurate, it may be added or corrected subsequently. Data elements 3.7 to 3.11 may need to be updated in the course of subsequent client contacts as this information can change over time. Data elements 3.12 (*Program Entry Date*) and 3.13 (*Program Exit Date*) are entered by staff (or computer-generated) every time a client enters or leaves a program.

For each Universal Data element, response categories are provided. For any data element, programs may choose to capture more detailed information as long as this information can be exactly mapped to the required response categories described in this section. Most data elements include a “Don’t Know” or “Refused” response category. These are considered valid responses if the client does not know or the client refuses to respond to the question.

#### *Race*

*Rationale:* Race is used to count the number of homeless persons who identify themselves within five different racial categories. In the October 30, 1997 issue of the Federal Register (62 FR 58782), the Office of Management and Budget (OMB) published “Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity.” All existing federal recordkeeping and report requirements must be in compliance with these Standards as of January 1, 2003. The data standards in this Notice follow the OMB guidelines and can be used to complete HUD form 27061.

*Data Source:* Client interview or self-administered form.

*When Data are Collected:* Upon initial program entry or as soon as possible thereafter.

*Subjects:* All clients.

*Definitions and Instructions:* In separate data fields, collect the self-identified race of each client served. Allow clients to identify multiple racial categories. Staff observations should not be used to collect information on race. Definitions of each of the race categories are as follows:

1 = American Indian or Alaska Native *is a person having origins in any of the original peoples of North and South America, including Central America, and who maintains tribal affiliation or community attachment.*

2 = Asian is a person having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand and Vietnam.

3 = Black or African American is a person having origins in any of the black racial groups of Africa. Terms such as “Haitian” can be used in addition to “Black or African American.”

4 = Native Hawaiian or Other Pacific Islander is a person having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands.

5 = White is a person having origins in any of the original peoples of Europe, the Middle East or North Africa.

### *Ethnicity*

*Rationale:* Ethnicity is used to count the number of homeless persons who identify themselves as Hispanic or Latino.

*Data Source:* Client interview or self-administered form.

*When Data are Collected:* Upon initial program entry or as soon as possible thereafter.

*Subjects:* All clients.

*Definitions and Instructions:* Collect the self-identified Hispanic or Latino ethnicity of each client served. Staff observations should not be used to determine ethnicity. The definition of Hispanic or Latino ethnicity is a person of Cuban, Mexican, Puerto Rican, South or Central American or other Spanish culture of origin, regardless of race.

### *Gender*

*Rationale:* To create separate counts of homeless men, women and transgendered clients served.

*Data Source:* Client interview or self-administered form. *When Data are Collected:* Upon initial program entry or as soon as possible thereafter. *Subjects:* All clients.

*Definitions and Instructions:* Record the reported gender of each client served. Gender should be assigned based on the client’s self-perceived gender identity. Transgender is defined as identification with, or presentation as, a gender that is different from the gender at birth.

### *Veteran Status*

*Rationale:* To determine the number of homeless veterans. *Data Source:* Client interview or self-administered form. *When Data are Collected:* Upon initial program entry or as soon as possible thereafter. *Subjects:* All adults served.

*Definitions and Instructions:* A veteran is someone who has served on active duty in the Armed Forces of the United States. This does not include inactive military reserves or the National Guard unless the person was called up to active duty.

### *Disabling Condition*

*Rationale:* Disability condition is needed to help identify clients that meet HUD's definition of chronically homeless and, depending on the source of program funds, may be required to establish client eligibility to be served by the program.

*Data Source:* Client interview, self-administered form, or assessment. Where disability is required to determine program eligibility, the data source is the evidence required by the funding source.

*When Data are Collected:* At any time *after* the client has been admitted into the program (unless a disabling condition is required for determining the client's eligibility for the program).

*Subjects:* All clients served.

*Definitions and Instructions:* For this data element, a disabling condition means: (1) a disability as defined in Section 223 of the Social Security Act; (2) a physical, mental, or emotional impairment which is (a) expected to be of long-continued and indefinite duration, (b) substantially impedes an individual's ability to live independently, and (c) of such a nature that such ability could be improved by more suitable housing conditions; (3) a developmental disability as defined in Section 102 of the Developmental Disabilities Assistance and Bill of Rights Act; (4) the disease of acquired immunodeficiency syndrome or any conditions arising from the etiological agency for acquired immunodeficiency syndrome; or (5) a diagnosable substance abuse disorder.

### *Residence Prior to Program Entry*

*Rationale:* To identify the type of residence and length of stay at that residence just prior to (i.e., the night before) program admission.

*Data Source:* Interview or self-administered form.

*When Data are Collected:* At any time *after* the client has been admitted into the program (unless a residence just prior to program admission is required for determining the client's eligibility for the program).

*Subjects:* All adults served and unaccompanied youth served.

*Definitions and Instructions:* Record the type of living arrangement of the client the night before their entry into the program. For rental by client and owned by client, select the response that includes the type of housing subsidy, if any, the client received. A housing subsidy may be tenant-, project- or sponsor-based and provides ongoing assistance to reduce rent burden. This includes either a housing subsidy provided through the Veterans Affairs Supportive Housing (VASH) program or other housing subsidy. Other housing subsidies may include a HUD-funded subsidy (e.g., public housing, Housing Choice Voucher or "Section 8") or other housing subsidy (e.g., state rental assistance voucher).

### *Required Response Categories:*

#### *Type of Residence*

- 1 = Emergency shelter, including hotel or motel paid for with emergency shelter voucher
- 2 = Transitional housing for homeless persons (including homeless youth)
- 3 = Permanent housing for formerly homeless persons
- 4 = Psychiatric hospital or other psychiatric facility
- 5 = Substance abuse treatment facility or detox center
- 6 = Hospital (non-psychiatric)
- 7 = Jail, prison or juvenile detention facility
- 12 = Staying or living in a family member's room, apartment or house
- 13 = Staying or living in a friend's room, apartment or house
- 14 = Hotel or motel paid for without emergency shelter voucher
- 15 = Foster care home or foster care group home

16 = Place not meant for habitation (e.g., a vehicle, an abandoned building, bus/train/subway station/airport or anywhere outside); inclusive of “non-housing service site (outreach programs only)”

17 = Other

18 = Safe Haven

19 = Rental by client, with VASH housing subsidy

20 = Rental by client, with other (non-VASH) ongoing housing subsidy

21 = Owned by client, with ongoing housing subsidy

22 = Rental by client, no ongoing housing subsidy

23 = Owned by client, no ongoing housing subsidy

8 = Don't Know

9 = Refused

*Length of Stay in Previous Place*

1 = One week or less

2 = More than one week, but less than one month

3 = One to three months

4 = More than three months, but less than one year

5 = One year or longer

8 = Don't Know

9 = Refused

*Zip Code of Last Permanent Address*

*Rationale:* To identify the former geographic location of persons experiencing homelessness or current geographic location of persons who are at risk of homelessness.

*Data Source:* Interview or self-administered form. *When Data are Collected:* Upon any program entry or as soon as possible thereafter. *Subjects:* All adults and unaccompanied youth served.

*Definitions and Instructions:* In one field, record the five-digit zip code of the apartment, room, or house where the client last lived for 90 days or more. In another field, record the appropriate zip code type (data quality code).



### *Program Entry Date*

*Rationale:* To determine the start of a client's period of program involvement with any CoC Program. This data element is needed for reporting purposes for all programs and to measure lengths of stay for residential programs.

*Data Source:* Program staff.

*When Data are Collected:* Upon any program entry (whether or not it is an initial program entry).

*Subjects:* All clients.

*Definitions and Instructions:* Record the month, day, and year of first day of service or program entry. For residential programs, this date would represent the first day of residence in the program following residence at any other place. There should be a new program entry date (and corresponding exit date) for each continuous period of residence. If there is a gap in residence (except for gaps allowed in Permanent Supportive Housing programs), a return to the residential program should be recorded as a new program entry date. For services, this date may represent the day of program enrollment, the day a service was provided, or the first date of a period of continuous participation in a service (e.g., daily, weekly or monthly). There should be a new program entry date (and corresponding program exit date) for each period of service. Therefore, any return to a program after a break in treatment, completion of the program, or termination of the program by the user or provider must be recorded as a new program entry date.

### *Program Exit Date*

*Rationale:* To determine the end of a period of program involvement for all clients of CoC Programs. This data element is required for reporting purposes for all programs and to calculate the lengths of stay in residential programs or the amount of time spent participating in services-only CoC Programs.

*Data Source:* Program staff.

*When Data are Collected:* Upon any program exit.

*Subjects:* All clients.

*Definitions and Instructions:* Record the month, day and year of last day of service. For a program providing housing or shelter to a client, this date would represent the last day of

continuous residence in the program's housing before the client transfers to another residential program or otherwise stops residing in the shelter or housing program. For example, if a person checked into an overnight shelter on January 30, 2008, stayed over night and left in the morning, the last date of service for that shelter stay would be January 31, 2008. If the client returned on February 2, 2008, a new program entry date is recorded.

### *Program-Specific Data Elements*

Program-Specific Data elements provide information about the characteristics of clients, the services that are provided, and client outcomes. These data elements must be collected from all clients served by programs that are required to report this information to HUD. Specifically, programs that receive funding through HUD's Supportive Housing Program, Shelter Plus Care, Section 8 Moderate Rehabilitation for Single Room Occupancy Dwellings (SRO) Program, and the homeless programs funded through the Housing Opportunities for Persons with AIDS (HOPWA) Program are required to collect most of this information in order to complete Annual Performance Reports (APRs). Likewise, programs that are funded through the Homelessness Prevention and Rapid Re-Housing Program are required to collect some of these data elements in order to submit Quarterly and Annual Performance Reports.

For programs with no such reporting requirements, these data standards are optional but recommended since they allow local Continuums of Care (CoCs) to obtain consistent information across a range of providers that can be used to plan service delivery, monitor the provision of services, and identify client outcomes. However, these data elements do not constitute a client assessment tool, and providers will need to develop their own data collection protocols in order to properly assess a client's need for services.

The Program-Specific Data elements that are needed for HUD reporting include:

- 4.1 Income and Sources (Not available in this thesis research)
- 4.2 Non-Cash Benefits (Not available in this thesis research)
- 4.3 Physical Disability
- 4.4 Developmental Disability

- 4.5 Chronic Health Condition
- 4.6 HIV/AIDS (Not available in this thesis research)
- 4.7 Mental Health
- 4.8 Substance Abuse
- 4.9 Domestic Violence
- 4.10 Destination (Not available in this thesis research)

For each Program-Specific Data element, multiple response categories are provided. Programs may choose to capture more detailed information (or finer response categories) as long as this information can be exactly mapped to the required response categories described in this section. Most data elements include a “Don’t Know” or “Refused” response category. These are considered valid responses if the client does not know or the client refuses to respond to the question.

Finally, many of these data elements represent transactions or information that may change over time. Most Program-Specific Data elements should be captured at program entry and exit, and a few must be captured at program entry, exit, and on an annual basis. Programs may decide when to collect the information on an annual basis, but HUD encourages programs that are required to complete an APR to update these data elements near the end of their APR operating year.

### *Physical Disability*

*Rationale:* To count the number of physically disabled persons served, determine eligibility for disability benefits, and assess the need for services. Needed to complete APRs for HUD-funded homeless assistance programs (excluding the Homelessness Prevention and Rapid Re-Housing Program (HPRP)).

*Data Source:* Client interview, self-administered form, or case manager records.

*When Data Are Collected:* In the course of client assessment once the individual is admitted—unless this information is needed prior to admission to determine program eligibility—at program exit, and at least once annually during program enrollment if the period between program entry and exit exceeds one year. Programs may decide when to collect the information on an annual basis, but HUD encourages programs that are

required to complete an APR to update these data elements near the end of their APR operating year.

*Subjects:* All clients served.

*Definition and Instructions:* In separate fields, determine (a) if the client has a physical disability, and (b) if the client is currently receiving services or treatment for this disability or received services or treatment prior to exiting the program. For the purposes of this Notice, a physical disability means a physical impairment which is (a) expected to be of long, continued and indefinite duration, (b) substantially impedes an individual's ability to live independently, and (c) of such a nature that such ability could be improved by more suitable housing conditions.

#### *Developmental Disability*

*Rationale:* To count the number of developmentally disabled persons served, determine eligibility for disability benefits, and assess their need for services. Needed to complete APRs for HUD-funded homeless assistance programs (excluding HPRP).

*Data Source:* Client interview, self-administered form and/or case manager records.

*When Data Are Collected:* In the course of client assessment once the individual is admitted—unless this information is needed prior to admission to determine program eligibility—at program exit, and at least once annually during program enrollment if the period between program entry and exit exceeds one year. Programs may decide when to collect the information on an annual basis, but HUD encourages programs that are required to complete an APR to update these data elements near the end of their APR operating year.

*Subjects:* All clients served.

*Definition and Instructions:* In separate fields, determine (a) if the client has a developmental disability, and (b) if the client is currently receiving services or treatment for this disability or received services or treatment prior to exiting the program. For the purposes of this Notice, a developmental disability means a severe, chronic disability that is attributed to a mental or physical impairment (or combination of physical and mental impairments) that occurs before 22 years of age and limits the capacity for independent living and economic self-sufficiency.

### *Chronic Health Condition*

*Rationale:* To count the number of persons served with severe health conditions and assess their need for healthcare and other medical services. Needed to complete APRs for HUD-funded homeless assistance programs (excluding HPRP).

*Data Source:* Client interview, self-administered form or case manager records.

*When Data Are Collected:* In the course of client assessment once the individual is admitted—unless this information is needed prior to admission to determine program eligibility—at program exit, and at least once annually during program enrollment if the period between program entry and exit exceeds one year. Programs may decide when to collect the information on an annual basis, but HUD encourages programs that are required to complete an APR to update these data elements near the end of their APR operating year.

*Subjects:* All clients served.

*Definition and Instructions:* In separate fields, determine (a) if the client has a chronic health condition, and (b) if the client is currently receiving services or treatment for this condition or received services or treatment prior to exiting the program. For the purposes of this Notice, a chronic health condition means a diagnosed condition that is more than three months in duration and is either not curable or has residual effects that limit daily living and require adaptation in function or special assistance. Examples of chronic health conditions include, but are not limited to, heart disease (including coronary heart disease, angina, heart attack and any other kind of heart condition or disease); severe asthma; diabetes; arthritis-related conditions (including arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia); adult onset cognitive impairments (including traumatic brain injury, post-traumatic distress syndrome, dementia, and other cognitive related conditions); severe headache/migraine; cancer; chronic bronchitis; liver condition; stroke; or emphysema.

### *Mental Health*

*Rationale:* To count the number of persons with mental health problems served and to assess the need for treatment. Needed to complete APRs for HUD-funded homeless assistance programs (excluding HPRP).

*Data Source:* Client interview, self-administered form or case manager records.

*When Data are Collected:* In the course of client assessment once the individual is admitted—unless this information is needed prior to admission to determine program eligibility—at program exit, and at least once annually during program enrollment if the period between program entry and exit exceeds one year. Programs may decide when to collect the information on an annual basis, but HUD encourages programs that are required to complete an APR to update these data elements near the end of their APR operating year.

*Subjects:* All clients served.

*Definition and Instructions:* In separate data fields, determine: (a) if the client has a mental health problem, (b) if the problem is expected to be of long-continued and indefinite duration *and* substantially impedes a client's ability to live independently, and (c) if the client is currently receiving services or treatment for the condition or received services or treatment prior to exiting the program. A mental health problem may include serious depression, serious anxiety, hallucinations, violent behavior or thoughts of suicide.

#### *Substance Abuse*

*Rationale:* To count the number of persons served with substance abuse problems and to assess the need for treatment. Needed to complete APRs for HUD-funded homeless assistance programs (excluding HPRP).

*Data Source:* Client interview, self-administered form and/or case manager records.

*When Data are Collected:* In the course of client assessment once the individual is admitted—unless this information is needed prior to admission to determine program eligibility—at program exit, and at least once annually during program enrollment if the period between program entry and exit exceeds one year. Programs may decide when to collect the information on an annual basis, but HUD encourages programs that are required to complete an APR to update these data elements near the end of their APR operating year.

*Subjects:* All clients served.

*Definition and Instructions:* In separate data fields, determine (a) if the client has an alcohol or drug abuse problem or both, (b) if the problem is expected to be of long-continued and indefinite duration *and* substantially impedes a client's ability to live independently, and (c) if the client is currently receiving services or treatment for the condition or received services or treatment prior to exiting the program.

### *Domestic Violence*

*Rationale:* Ascertaining whether a person is a victim of domestic violence is necessary to provide the person with the appropriate services to prevent further abuse and to treat the physical and psychological injuries from prior abuse. Also, ascertaining that a person may be experiencing domestic violence may be important for the safety of program staff and other clients. At the aggregate level, knowing the size of the homeless population that has experienced domestic violence is critical for determining the resources needed to address the problem in this population. Needed to complete APRs for HUD-funded homeless assistance programs (excluding HPRP).

*Data Source:* Client interview, self-administered form and/or case manager records.

*When Data are Collected:* In the course of client assessment. *Subjects:* All adults and unaccompanied youth served.

*Definition and Instructions:* In separate fields, determine if the person has ever been a victim of domestic violence.

*Required Response Categories:*

Victim of Domestic Violence: True or False.

### *Optional Data Elements*

In addition to the data elements that are required for APR reporting, additional program-specific data elements have been recommended by a team of HMIS practitioners, federal agency representatives, and researchers. These data elements are based on best practices that are currently being implemented at the local level. Only Adult Education and Reason for Leaving were included in this study.

4.15A Employment (Not available in this thesis research)

4.15B Adult Education

- 4.15C General Health Status (Not available in this thesis research)
- 4.15D Pregnancy Status (Not available in this thesis research)
- 4.15E Veteran's Information (Not available in this thesis research)
- 4.15F Children's Education (Not available in this thesis research)
- 4.15G Reason for Leaving
- 4.15H Services Provided (Not available in this thesis research)

### *Education*

Rationale: To assess client's readiness for employment and need for education services.

Data Source: Client interview or self-administered form.

When Data are Collected: In the course of client assessment nearest to program entry, at program exit and at least once annually during program enrollment, if the period between program entry and exit exceeds one year.

Subjects: All clients served or all adults and unaccompanied youth.

Definition and Instructions: In four separate fields, determine: (1) if the client is currently in school or working on any degree or certificate; (2) whether the client has received any vocational training or apprenticeship certificates; (3) what is the highest level of school that the client has completed; and (4) if the client has received a high school diploma or General Educational Development (GED), what degree(s) has the client earned. Allow clients to identify multiple degrees.

Required Response Categories:

Response Categories

Currently in school or working on any degree or certificate

0 = No 1 = Yes 8 = Don't Know 9 = Refused

Received vocational training or apprenticeship certificates

0 = No 1 = Yes 8 = Don't Know 9 = Refused

Highest level of school completed

0=No schooling completed 1=Nursery school to 4th grade 2=5th grade or 6th grade

3=7th grade or 8th grade 4=9th grade 5=10th grade 6=11th grade 7=12th grade, No diploma 10 = High school diploma 11= GED 12 = Post-secondary school 8 = Don't Know 9 = Refused



If client has received a high school diploma, GED or enrolled in post-secondary education, what degree(s) has the client earned

0 = None

1 = Associates Degree

2 = Bachelors Degree

3 = Masters Degree

4 = Doctorate Degree

5 = Other graduate/professional degree

6 = Certificate of advanced training or skilled artisan

8 = Don't Know

9 = Refused

### *Reason for Leaving*

Rationale: Reason for leaving is used, in part, to identify the barriers and issues clients face in completing a program or staying in a residential facility, which may affect their ability to achieve economic self-sufficiency.

Data Source: Client interview, self-administered form or case manager records.

When Data Are Collected: At program exit.

Subjects: All clients served.

Definition and Instructions: Identify the reason why the client left the program. If a client left for multiple reasons, record only the primary reason.

Required Response Categories:

Response Categories

Reason for leaving

1 = Left for a housing opportunity before completing program

2 = Completed program

3 = Non-payment of rent/occupancy charge

4 = Non-compliance with program

5 = Criminal activity/destruction of property/violence

6 = Reached maximum time allowed by program

7 = Needs could not be met by program

8 = Disagreement with rules/persons

9 = Death

10 = Unknown/disappeared

11 = Other

In addition to the definitions provided above in the HMIS Data Standards document, HUD provides a separate definition for the term “chronically homeless person.” The guide, *Defining Chronic Homelessness: A Technical Guide for HUD Programs*, September 2007, discusses the term below. The characteristic of a “chronically homeless person” is a relevant variable for the purpose of this thesis research. HUD adopted the Federal definition which defines a chronically homeless person as “either (1) an unaccompanied homeless individual with a disabling condition (defined as a diagnosable substance abuse disorder or a serious mental illness or a developmental disability or a chronic physical illness or disability including the co-occurrence of two or more of these conditions) who has been continuously homeless for a year or more, OR (2) an unaccompanied individual with a disabling condition who has had at least four episodes of homelessness in the past three years.” This definition is adopted by HUD from a federal standard that was arrived upon through collective decision making by a team of federal agencies including HUD, the U.S. Department of Labor, the U.S. Department of Health and Human Services, the U.S. Department of Veterans Affairs, and the U.S. Interagency Council on Homelessness.

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